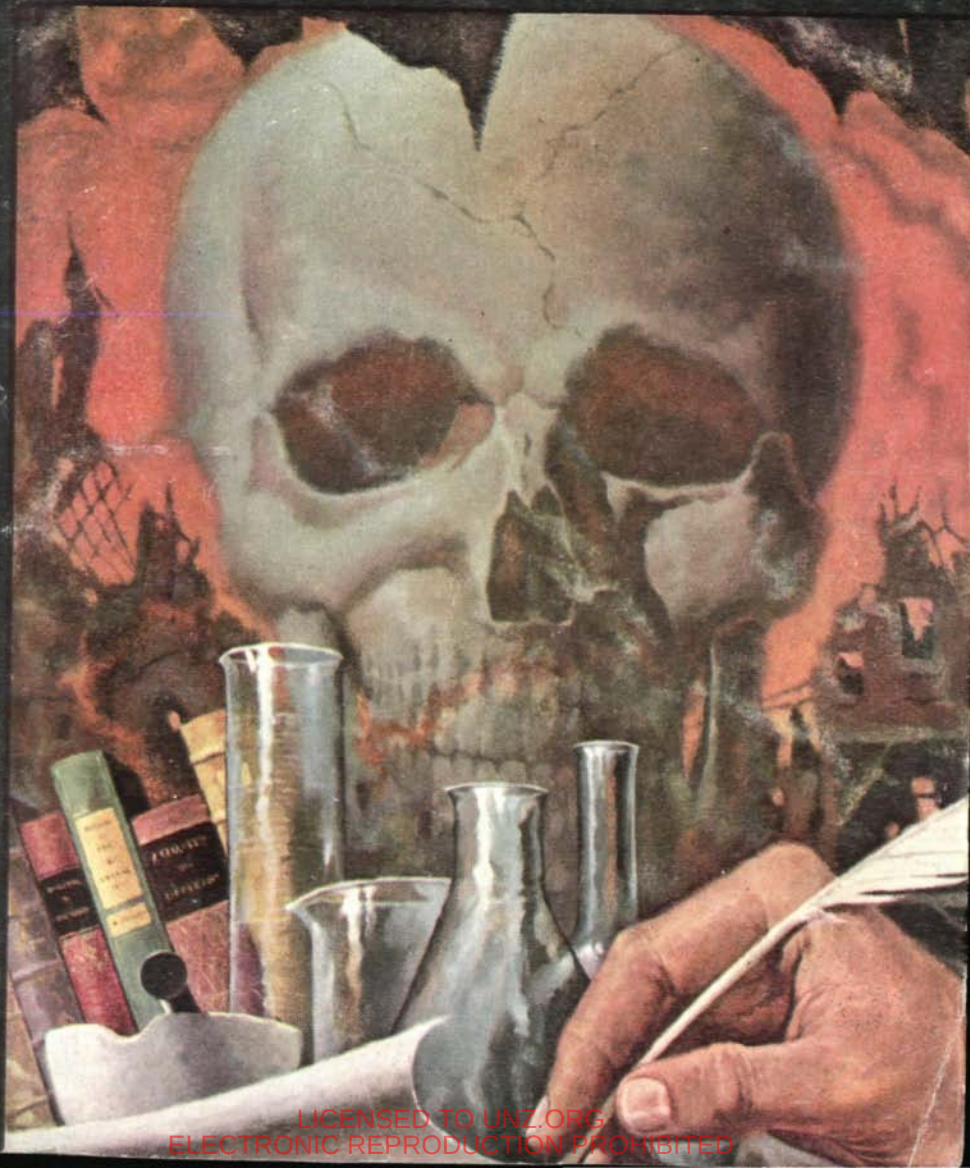


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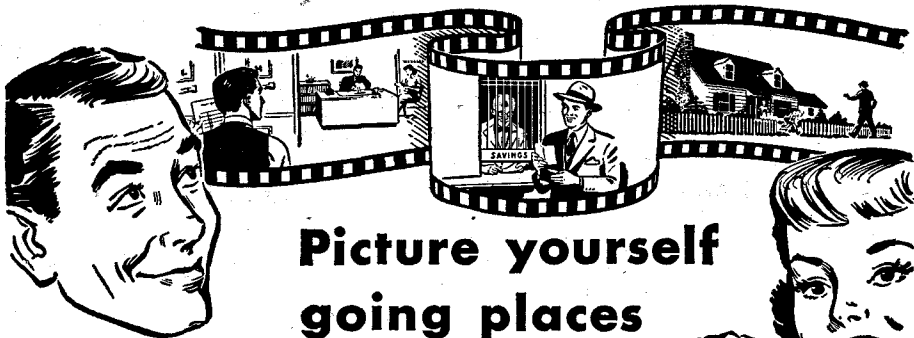
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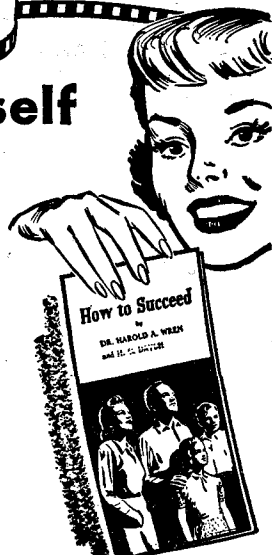
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REDUNDANCE

The development of Information Theory is, it seems to me, of far wider importance than the mere business of making telephones, computing machines, and telegraph equipment work better and more efficiently. In the most basic expansion of the concept, the human mind itself is, quite clearly, an information handling device, and whether you insist on absolute materialism, or the importance of putting aside worldly things and concentrating on Higher Things—the consideration of the question is itself information handling.

There's been tremendous interest in cybernetics; cybernetics might be defined as the study of mechanisms and methods of handling and applying information. Information theory is decidedly more fundamental than cybernetic theory; cybernetics is the study of how-to-do-it, while Information Theory is the study of what-to-do.

Naturally, being in the business I am, my interest in Information Theory has tended to develop its possibilities in the field of art and communication via stories and articles. The factor in Information Theory that has interested me there is this concept: Information Theory discusses, among other things, the nature and importance of Redundance. Suppose we send a telegraph message using such a code that every single pulse is essential to the transmission of the message. This represents one hundred per cent efficiency of transmission. Let's call that a redundancy of 1.000.

This Redundance 1.000 transmission has a difficulty, however; if one single pulse is lost, the *entire message* is lost.

Consider the little warning rhyme of old:

Boy, gun.

Joy! Fun!

Gun bust.

Boy dust.

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That little item has about as low redundancy as any English language statement I know. The entire meaning of that rhyme can be practically obliterated by the omission of any single letter!

Now on the surface of things, it would appear that a redundancy of 1.000 would represent the most efficient transformation of information possible; it's a one hundred per cent proposition. Actually, it's not the most efficient possible for two reasons, and higher efficiency of transmission comes *at any level except 1.000!*

First, a message transmission so sensitive to failure that the loss of a single signal-pulse destroys the coherence of the message is not satisfactory in a real world. There are too many noise sources; we need a redundancy factor that will allow the message to get through successfully even if one or two pulses—or lack-of-pulses, which means simply a negative pulse—are misplaced. A redundancy of 2.00 can be achieved by simply transmitting each part of the message twice. A redundancy of sixteen would mean transmitting each part sixteen times over.

One of the major faults in computing machinery is that the darned gadgets work on a redundancy 1.000 basis. If you have a computer designed to keep a running stock inventory, and it's designed to handle the information "Hammers, claw, two pound" the stupid thing will be thrown for a total

loss if someone gives it the information "Hammer, claw, two pound. . . . One." The machine operates at redundancy 1.000, and every single pulse and not-pulse, or space, is absolutely critical to the message. The individual who typed in the message made a mistake: the machine can handle information about "hammers, claw. . . ." correctly—but "hammer, claw . . ." is different.

The human mind operates magnificently on a range of redundancy that is fantastic. We're so supernally good at it, that we neglect to consider the importance of redundancy 1.000; that level is critical because that level, *and that level only*, exists in our real physical world, at the perceptible level. Every event—every object—is a Redundance 1.000 event or object.

Only at the sub-perceptible level of molecular and atomic phenomena do we actually encounter high redundancy; two hydrogen atoms actually does represent an effective redundancy of 2.000 because they actually are indistinguishable.

A second factor that is by no means so obvious is the high importance of fractional redundancy—redundancy *less* than one. We're so used to operating at extremely low fractional redundancy that we aren't aware of that fact. Our normal operating level must be somewhere in the neighborhood of 10^{-6} to 10^{-18} as a rough guesstimate.

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and communicating the abstract, if you stop to think about it, is simply a matter of operating on fractional redundancy. Let's consider the little rhyme above, again, but in a different light. What is the message actually conveyed by "boy"? Try writing out the *full* message—and discover that fifteen full-size encyclopedias can't contain it.

What we're doing here is dealing with the sort of message the telegraph companies handle when they send "24," and at the other end, the message is typed out "Our heartiest congratulations on your marriage! We both wish we could have been there, and we hope you'll have many long and happy years together."

This type of fractional redundancy operates on the basis that the full message has been experienced by both transmitter and receiver, and that agreed-on code-designations for the *memory-system* involved exist. The message itself is not being transmitted, but a code designation association that has been agreed on and thus made a part of the original message has been.

To indicate that the code-designation has been made part of the original message, consider this. If I type here, "Our Father . . ." to 99.9% of our readers, the part of the message stands for the whole; redundancy of a low fractional value is adequate. This is recognized in the generally used term Pater Noster—

which is precisely the same type of designation, for precisely the same thing, in a different language.

We have, then, effective communication at enormously high rate, achieved by using abstract-and-memory systems. This is useful in communication concerning the past. But there's an additional type of extremely low redundancy communication that operates on a different system, or, to be more precise, a hyper-development and extension of the other system.

Imagine yourself in a car, going about fifty-five, approaching a curve on a mountain road. You discover rains have caused a huge boulder to fall onto the road in front of you—and that your brakes don't work.

The above paragraph contains no reference to a smash-up; not more than about .2% of our readers have ever been involved in an experience such as described. Whence, then, the idea of the car smashing into the boulder, the grinding of metal on rock, the sounds of breaking glass, and so on?

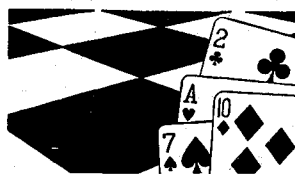
The second type of extremely low-redundance communication depends on the receiver's ability to accept postulates and develop them in great detail, high expansion, from the original communication.

If we imagined an infinitely competent, enormously swift logical mind, it is necessary that giving Euclid's

Continued on page 158

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NULL-ABC

BY H. BEAM PIPER AND JOHN J. McGUIRE

First of two parts. There's some reaction these days that holds scientists responsible for war. Take it one step further: What happens if "book-learnin'" is held responsible . . . ?

Illustrated by van Dongen

Chester Pelton retracted his paunch as far as the breakfast seat would permit; the table, its advent preceded by a collection of mouth-watering aromas, slid noiselessly out of the pantry and clicked into place in front of him.

"Everything all right, Miss Claire?" a voice floated out after it from beyond. "Anything else you want?"

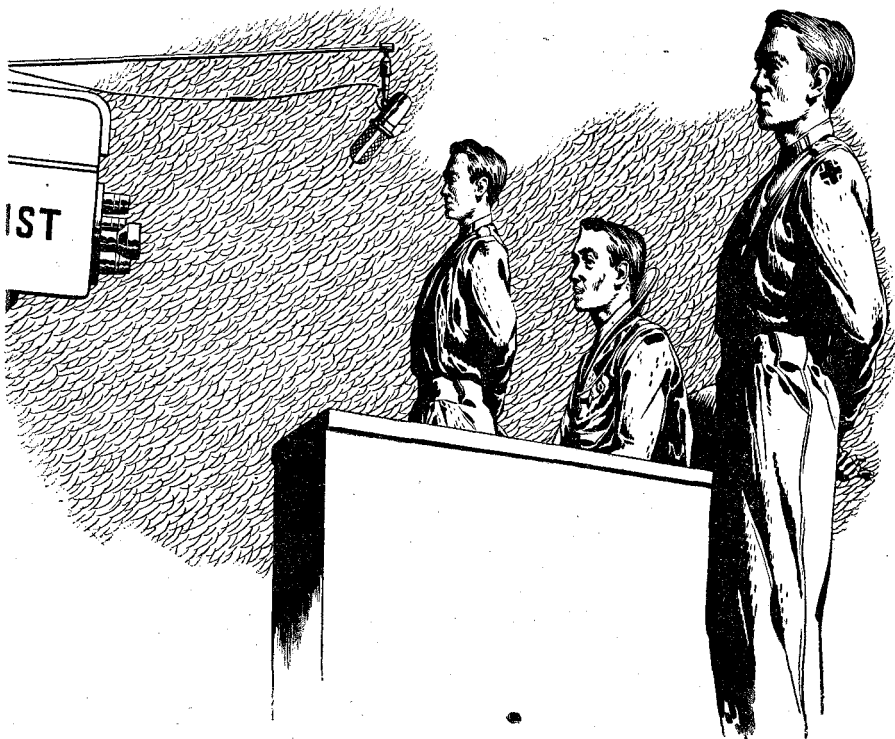
"Everything's just fine, Mrs. Harris," Claire replied. "I suppose Mr. Pelton'll want seconds, and Ray'll probably want thirds and fourths of everything." She waved a hand over the photocell that closed the pantry door, and slid into place across from her brother, who already had a glass of fruit juice in one hand and was lifting platter covers with the other.

"Real eggs!" the boy was announcing. "Bacon. Wheat-bread toast." He looked again. "Hey, Sis, is this real cow-made butter?"

"Yes. Now go ahead and eat."

As though Ray needed encouragement, Chester Pelton thought, watching his son use a spoon—the biggest one available—to dump gobs of honey on his toast. While he was helping himself to bacon and eggs, he could hear Ray's full-mouthed exclamation: "This is real bee-comb honey, too!" That pleased him. The boy was a true Pelton; only needed one bite to distinguish between real and synthetic food.

"Bet this breakfast didn't cost a dollar under five C," Ray continued, a little more audibly, between bites.



That was another Pelton trait; even at fifteen, the boy was learning the value of money. Claire seemed to disapprove, however.

"Oh, Ray; try not to always think of what things cost," she reproved.

"If I had all she spends on natural food, I could have a this-season's model 'copter-bike, like Jimmy Hartnett," Ray continued.

Pelton frowned. "I don't want you running around with that boy, Ray," he said, his mouth full of bacon and eggs. Under his daughter's look of

disapproval, he swallowed hastily, then continued: "He's not the sort of company I want my son keeping."

"But, Senator," Ray protested. "He lives next door to us. Why, we can see Hartnett's aerial from the top of our landing stage!"

"That doesn't matter," he said, in a tone meant to indicate that the subject was not to be debated. "He's a Literate!"

"More eggs, Senator?" Claire asked, extending the platter and gesturing with the serving knife.

He chuckled inwardly. Claire always knew what to do when his temper started climbing to critical mass. He allowed her to load his plate again.

"And speaking of our landing stage, have you been up there, this morning, Ray?" he asked.

They both looked at him inquiringly.

"Delivered last evening, while you two were out," he explained. "New winter model Rolls-Cadipac." He felt a glow of paternal pleasure as Claire gave a yelp of delight and aimed a glancing kiss at the top of his bald head. Ray dropped his fork, slid from his seat, and bolted for the lift, even bacon, eggs, and real bee-comb honey forgotten.

With elaborate absent-mindedness, Chester Pelton reached for the switch to turn on the video screen over the pantry door.

"Oh-oh! Oh-oh!" Claire's slender hand went out to stop his own. "Not till coffee and cigarettes, Senator."

"It's almost oh-eight-fifteen; I want the newscast."

"Can't you just relax for a while? Honestly, Senator, you're killing yourself."

"Oh, rubbish! I've been working a little hard, but—"

"You've been working too hard. And today, with the sale at the store, and the last day of the campaign—"

"Why the devil did that idiot of a Latterman have the sale advertised

for today, anyhow?" he fumed. "Doesn't he know I'm running for the Senate?"

"I doubt it," Claire said. "He may have heard of it, the way you've heard about an election in Pakistan or Abyssinia, or he just may not know there is such a thing as politics. I think he does know there's a world outside the store, but he doesn't care much what goes on in it." She pushed her plate aside, poured a cup of coffee, and levered a cigarette from the Readilit, puffing at it with the relish of the morning's first smoke. "All he knows is that we're holding our sale three days ahead of Macy & Gimbel's."

"Russ is a good businessman," Pelton said seriously. "I wish you'd take a little more interest in him, Claire."

"If you mean what I think you do, no thanks," Claire replied. "I suppose I'll get married, some day—most girls do—but it'll be to somebody who can hang his business up at the office before he comes home. Russ Latterman is so married to the store that if he married me too, it'd be bigamy. Ready for your coffee?" Without waiting for an answer, she filled his cup and ejected a lighted cigarette from the box for him, then snapped on the video screen.

It lit at once, and a nondescriptly handsome young man was grinning toothily out of it. He wore a white smock, halfway to his knees, and,

over it, an old-fashioned Sam Browne belt which supported a bulky leather-covered tablet and a large stylus. On the strap which crossed his breast five or six little metal badges twinkled.

"... Why no other beer can compare with delicious, tangy, Cardon's Black Bottle. Won't you try it?" he pleaded. "Then you will see for yourself why millions of happy drinkers always Call For Cardon's. And now, that other favorite of millions, Literate First Class Elliot C. Mongery."

Pelton muttered: "Why Frank sponsors that blabbermouth of a Mongery—"

Ray, sliding back onto the bench, returned to his food.

"Jimmy's book had pictures," he complained, forking up another mixture of eggs, bacon, toast and honey.

"Book?" Claire echoed. "Oh, the instructions for the 'copter?"

"Pipe down, both of you!" Pelton commanded. "The newscast—"

Literate First Class Elliot C. Mongery, revealed by a quick left quarter-turn of the pickup camera, wore the same starchy white smock, the same Sam Browne belt glittering with the badges of the organizations and corporations for whom he was authorized to practice Literacy. The tablet on his belt, Pelton knew, was really a camouflaged holster for a small automatic, and the gold stylus was a gas-projector. The black-leather-jacketed bodyguards, of course, were

discreetly out of range of the camera. Members of the Associated Fraternities of Literates weren't exactly loved by the non-reading public they claimed to serve. The sight of one of those starchy, perpetually-spotless, white smocks always affected Pelton like a red cape to a bull. He snorted in disdain. The raised eyebrow toward the announcer on the left, the quick, perennially boyish smile, followed by the levelly serious gaze into the camera—the whole act might have been a film-transcription of Mongery's first appearance on the video, fifteen years ago. At least, it was off the same ear of corn.

"That big hunk of cheese," Ray commented. For once, Pelton didn't shush him; that was too close to his own attitude, at least in family-break-fast-table terminology.

"... First of all; for the country, and especially the Newer New York area, and by the way, it looks as though somebody thought somebody needed a little cooling off, but we'll come to that later. Here's the forecast: Today and tomorrow, the weather will continue fine; warm in the sun, chilly in the shadows. There won't be anything to keep you from the polls, tomorrow, except bird-hunting, or a last chance at a game of golf. This is the first time within this commentator's memory that the weather has definitely been in favor of the party out of power.

"On the world scene: You'll be

glad to hear that the survivors of the wrecked strato-rocket have all been rescued from the top of Mount Everest, after a difficult and heroic effort by the Royal Nepalese Air Force. . . . The results of last week's election in Russia are being challenged by twelve of the fourteen parties represented on the ballot; the only parties not hurling accusations of fraud are the Democrats, who won, and the Christian Communists, who are about as influential in Russian politics as the Vegetarian-Anti-Vaccination Party is here. . . . The Central Diplomatic Council of the Re-united Nations has just announced, for the hundred and seventy-eighth time, that the Arab-Israel dispute has been finally, definitely and satisfactorily settled. This morning's reports from Baghdad and Tel Aviv only list four Arabs and six Israelis killed in border clashes in the past twenty-four hours, so maybe they're really getting things patched up, after all. During the same period, there were more fatalities in Newer New York as a result of clashes between the private troops of rival racket gangs, political parties and business houses.

"Which brings us to the local scene. On my way to the studio this morning, I stopped at City Hall, and found our genial Chief of Police Delaney, 'Irish' Delaney to most of us, hard at work with a portable disintegrator, getting rid of record disks and recording tapes of old and long-settled cases.

He had a couple of amusing stories. For instance, a lone Independent-Conservative partisan broke up a Radical-Socialist mass meeting preparatory to a march to demonstrate in Double Times Square, by applying his pocket lighter to one of the heat-sensitive boxes in the building and activating the sprinkler system. By the time the Radicals had gotten into dry clothing, there was a, well, sort of, impromptu Conservative demonstration going on in Double Times Square, and one of the few things the local gendarmes won't stand for is an attempt to hold two rival political meetings in the same area.

"Curiously, while it was the Radicals who got soaked, it was the Conservatives who sneezed;" Mongery went on, his face glowing with mischievous amusement. "It seems that while they were holding a monster rally at Hague Hall, in North Jersey Borough, some person or persons unknown got at the air-conditioning system with a tank of sneeze gas, which didn't exactly improve either the speaking style of Senator Grant Hamilton or the attentiveness of his audience. Needless to say, there is no police investigation of either incident. Election shenanigans, like college pranks, are fair play as long as they don't cause an outright holocaust. And that, I think, is as it should be," Mongery went on, more seriously. "Most of the horrors of the Twentieth and Twenty-first Centuries were the

result of taking politics too seriously.”

Pelton snorted again. That was the Literate line, all right; treat politics as a joke and an election as a sporting event, let the Independent-Conservative grafters stay in power, and let the Literates run the country through them. Not, of course, that he disapproved of those boys in the Young Radical League who'd thought up that sneeze-gas trick.

“And now, what you've been waiting for,” Mongery continued. “The final Trotter Poll's pre-election analysis.” A novice Literate advanced, handing him a big loose-leaf book, which he opened with the reverence a Literate always displayed toward the written word. “This,” he said, “is going to surprise you. For the whole state of Penn-Jersey-York, the poll shows a probable Radical-Socialist vote of approximately thirty million, an Independent-Conservative vote of approximately ten and a half million, and a vote of about a million for what we call the Who-Gives-A-Damn Party, which, frankly, is the party of your commentator's choice. Very few sections differ widely from this average—there will be a much heavier Radical vote in the Pittsburgh area, and traditionally Conservative Philadelphia and the upper Hudson Valley will give the Radicals a much smaller majority.”

They all looked at one another, thunderstruck.

“If Mongery's admitting that, I'm

in!” Pelton exclaimed.

“Yeah, we can start calling him Senator, now, and really mean it,” Ray said. “Maybe old Mongie isn't such a bad sort of twerp, after all.”

“Considering that the Conservatives carried this state by a substantial majority in the presidential election of two years ago, and by a huge majority in the previous presidential election of 2136,” Mongery, in the screen, continued, “this verdict of the almost infallible Trotter Poll needs some explaining. For the most part, it is the result of the untiring efforts of one man, the dynamic new leader of the Radical-Socialists and their present candidate for the Consolidated States of North America Senate, Chester Pelton, who has transformed that once-moribund party into the vital force it is today. And this achievement has been due, very largely, to a single slogan which he had hammered into your ears: *Put the Literates in their place; our servants, not our masters!*” He brushed a hand deprecatingly over his white smock and fingered the badges on his belt.

“There has always been, on the part of the Illiterate public, some resentment against organized Literacy. In part, it has been due to the high fees charged for Literate services, and to what seems, to many, to be monopolistic practices. But behind that is a general attitude of anti-intellectualism which is our heritage from the disastrous wars of the

Twentieth and Twenty-first Centuries. Chester Pelton has made himself the spokesman of this attitude. In his view, it was men who could read and write who hatched the diabolical political ideologies and designed the frightful nuclear weapons of that period. In his mind, Literacy is equated with '*Mein Kampf*' and '*Das Kapital*', with the A-bomb and the H-bomb, with concentration camps and blasted cities. From this position, of course, I beg politely to differ. Literate men also gave us the Magna Charta and the Declaration of Independence.

"Now, in spite of a lunatic fringe in the Consolidated Illiterates' Organization who want just that, Chester Pelton knows that we cannot abolish Literacy entirely. Even with modern audio-visual recording, need exists for some modicum of written recording, which can be rapidly scanned and selected from—indexing, cataloguing, tabulating data, et cetera—and for at least a few men and women who can form and interpret the written word. Mr. Pelton, himself, is the owner of a huge department store, employing over a thousand Illiterates; he must at all times have the services of at least fifty Literates."

"And pays through the nose for them, too!" Pelton growled. It was more than fifty; and Russ Latterman had been forced to get twenty extras sent in for the sale.

"Now, since we cannot renounce

Literacy entirely, without sinking to *fellahin* barbarism, and here I definitely part company with Mr. Pelton, he fears the potential power of organized Literacy. In a word, he fears a future Literate Dictatorship."

"Future? What do you think we have now?" Pelton demanded.

"Nobody," Mongery said, as though replying to him, "is stupid enough, today, to want to be a dictator. That ended by the middle of the Twenty-first Century. Everybody knows what happened to Mussolini, and Hitler, and Stalin, and all their imitators. Why, it is as much the public fear of Big Government as the breakdown of civil power because of the administrative handicap of a shortage of Literate administrators that is responsible for the disgraceful lawlessness of the past hundred years. Thus, it speaks well for the public trust in Chester Pelton's known integrity and sincerity that so many of our people are willing to agree to his program for socialized Literacy. They feel that he can be trusted, and, violently as I disagree with him, I can only say that that trust is not misplaced.

"Of course, there is also the question, so often raised by Mr. Pelton, that under the Hamilton machine, the politics, and particularly the enforcement of the laws, in this state, are unbelievably corrupt, but I wonder—"

Mongery paused. "Just a moment; I see a flash bulletin being brought in."

The novice Literate came to his side and gave him a slip of paper, at which he glanced. Then he laughed heartily.

"It seems that shortly after I began speaking, the local blue-ribbon grand jury issued a summons for Chief Delaney to appear before them, with all his records. Unfortunately, the summons could not be served; Chief Delaney had just boarded a strato-rocket from Tom Dewey Field for Buenos Aires." He cocked an eye at the audience. "I know Irish is going to have a nice time, down there in the springtime of the Southern Hemisphere. And, incidentally, the Argentine is one of the few major powers which never signed the World Extradition Convention of 2087." He raised his hand to his audience. "And now, until tomorrow at breakfast, sincerely yours for Cardon's Black Bottle, Elliot C. Mongery."

"Well, whattaya know; that guy was plugging for you!" Ray said. "And see how he managed to slide in that bit about corruption, right before his stooge handed him that bulletin?"

"I guess every Literate has his price," Chester Pelton said. "I wonder how much of my money that cost. I always wondered why Frank Cardon sponsored Mongery. Now I know. Mongery can be had."

"Uh, beg your pardon, Mr. Pelton," a voice from the hall broke in.

He turned. Olaf Olafsson, the 'copter driver, was standing at the

entrance to the breakfast nook, a smudge of oil on his cheek and his straw-colored hair in disorder. "How do I go about startin' this new 'copter?"

"What?" Olaf had been his driver for ten years. He would have been less surprised had the ceiling fallen in. "You don't know how to start it?"

"No, sir. The controls is all different from on the summer model. Every time I try to raise it, it backs up; if I try to raise it much more, we won't have no wall left on the landing stage."

"Well, isn't there a book?"

"There ain't no pictures in it; nothing but print. It's a Literate book," Olaf said in disgust, as though at something obscene. "An' there ain't nothin' on the instrument board but letters."

"That's right," Ray agreed. "I saw the book; no pictures in it at all."

"Well, of all the quarter-witted stupidity! The confounded imbeciles at that agency—"

Pelton started to his feet. Claire unlocked the table and slid it out of his way. Ray, on a run, started for the lift and vanished.

"I think some confounded Literate at the Rolls-Cadipac agency did that," he fumed. "Thought it would be a joke to send me a Literate instruction book along with a 'copter with a Literate instrument board. Ah, I get it! So I'd have to call in a Literate to show me how to start my own 'copter, and by noon they'd be laughing

about it in every bar from Pittsburgh to Plattsburg. Sneaky Literate trick!" They went to the lift, and found the door closed in their faces. "Oh, con-found that boy!"

Claire pressed the button. Ray must have left the lift, for the operating light went on, and in a moment the door opened. He crowded into the lift, along with his daughter and Olaf.

On the landing stage, Ray was already in the 'copter, poking at buttons on the board.

"Look, Olaf!" he called. "They just shifted them around a little from the summer model. This one, where the prop-control used to be on the old model, is the one that backs it up on the ground. Here's the one that erects and extends the prop,"—he pushed it, and the prop snapped obediently into place—"and here's the one that controls the lift."

An ugly suspicion stabbed at Chester Pelton, bringing with it a feeling of frightened horror.

"How do you know?" he demanded.

Ray's eyes remained on the instrument board. He pushed another button, and the propeller began swinging in a lazy circle; he pressed down with his right foot, and the 'copter lifted a foot or so.

"What?" he asked. "Oh; Jimmy showed me how theirs works. Mr. Hartnett got one like it a week ago." He motioned to Olaf, setting the 'copter down again. "Come here; I'll show you."

The suspicion, and the horror, passed in a wave of relief.

"You think you and Olaf, between you, can get that thing to school?" he asked.

"Sure! Easy!"

"All right. You show Olaf how to run it. Olaf, as soon as you've dropped Ray at school, take that thing to the Rolls-Cadipac agency, and get a new one, with a proper instrument board, and a proper picture book of operating instructions. I'm going to call Sam Huschack up personally and give him royal hell about this. Sure you can handle it, now?"

He watched the 'copter rise to the two thousand foot local traffic level and turn in the direction of Mineola High School, fifty miles away. He was still looking anxiously after it as it dwindled to a tiny dot and vanished.

"They'll make it all right," Claire told him. "Olaf has a strong back, and Ray has a good head."

"It wasn't that that I was worried about." He turned and looked, half ashamed, at his daughter. "You know, for a minute, there, I thought . . . I thought Ray could read!"

"Father!" She was so shocked that she forgot the nickname they had given him when he had announced his candidacy for Senate, in the spring. "You didn't!"

"I know; it's an awful thing to think, but— Well, the kids today do the craziest things. There's that Hart-

nett boy he runs around with; Tom Hartnett bought Literate training for him. And that fellow Prestonby; I don't trust him—"

"Prestonby?" Claire asked, puzzled.

"Oh, you know. The principal at school. You've met him."

Claire wrinkled her brow—just like her mother, when she was trying to remember something.

"Oh, yes. I met him at that P.T.A. meeting. He didn't impress me as being much like a teacher, but I suppose they think anything's good enough for us Illiterates."

Literate First Class Ralph N. Prestonby remained standing by the lectern, looking out over the crowded auditorium, still pleasantly surprised to estimate the day's attendance at something like ninety-seven per cent of enrollment. That was really good; why, it was only three per cent short of perfect! Maybe it was the new rule requiring a sound-recorded excuse for absence. Or it could have been his propaganda campaign about the benefits of education. Or, very easily, it could have been the result of sending Doug Yetsko and some of his boys around to talk to recalcitrant parents. It was good to see that that was having some effect beside an increase in the number of attempts on his life, or the flood of complaints to the Board of Education. Well, Lancedale had gotten Education merged with his

Office of Communications, and Lancedale was back of him to the limit, so the complaints had died out on the empty air. And Doug Yetsko was his bodyguard, so most of the would-be assassins had died, also.

The "North American Anthem," which had replaced the "Star-Spangled Banner" after the United States-Canadian-Mexican merger, came to an end. The students and their white-smocked teachers, below, relaxed from attention; most of them sat down, while monitors and teachers in the rear were getting the students into the aisles and marching them off to study halls and classrooms and workshops. The orchestra struck up a lively march tune. He leaned his left elbow—Literates learned early, or did not live to learn, not to immobilize the right hand—on the lectern and watched the interminable business of getting the students marched out, yearning, as he always did at this time, for the privacy of his office, where he could smoke his pipe. Finally, they were all gone, and the orchestra had gathered up its instruments and filed out into the wings of the stage, and he looked up to the left and said, softly:

"All right, Doug; show's over."

With a soft thud, the big man dropped down from the guard's cubicle overhead, grinning cheerfully. He needed a shave—Yetsko always did, in the mornings—and in his leather Literates' guard uniform, he looked



like some ogreish giant out of the mythology of the past.

"I was glad to have you up there with the Big Noise, this morning," Prestonby said. "What a mob! I'm still trying to figure out why we have such an attendance."

"Don't you get it, captain?" Yetsko was reaching up to lock the door of his cubicle; he seemed surprised at Prestonby's obtuseness. "Day before election; the little darlings' moms and pops don't want them out running around. We can look for another big crowd tomorrow, too."

Prestonby gave a snort of disgust. "Of course; how imbecilic can I really get? I didn't notice any of them falling down, so I suppose you didn't see anything out of line."

"Well, the hall monitors make them turn in their little playthings at the doors," Yetsko said, "but hall monitors can be gotten at, and some of the stuff they make in Manual Training, when nobody's watching them—"

Prestonby nodded. Just a week before, a crude but perfectly operative 17-mm shotgun had been discovered in the last stages of manufacture in the machine shop, and five out of six of the worn-out files would vanish, to be ground down into dirks. He often thought of the stories of his grandfather, who had been a major during the Occupation of Russia, after the Fourth World War. Those old-timers didn't know how easy they'd had it;

they should have tried to run an illiterate high school.

Yetsko was still grumbling slanders on the legitimacy of the student body. "One of those little angels shoots me, it's just a cute little prank, and we oughtn't to frown on the little darling when it's just trying to express its dear little personality, or we might give it complexes, or something," he falsettoed incongruously. "And if the little darling's mistake doesn't kill me outright and I shoot back, people talk about King Herod!" He used language about the Board of Education and the tax-paying public that was probably subversive within the meaning of the Loyalty Oath. "I wish I had a pair of 40-mm auto-cannons up there, instead of that sono gun."

"Each class is a little worse than the one before; in about five years, they'll be making H-bombs in the lab," Prestonby said. In the last week, a dozen pupils had been seriously cut or blackjacked in hall and locker-room fights. "Nice citizens of the future; nice future to look forward to growing old in."

"We won't," Yetsko comforted him. "We can't be lucky all the time; in about a year, they'll find both of us stuffed into a broom closet, when they start looking around to see what's making all the stink."

Prestonby took the thick-barreled gas pistol from the shelf under the lectern and, shoved it into his hip

pocket; Yetsko picked up a two-and-a-half foot length of rubber hose and tucked it under his left arm. Together, they went back through the wings and out into the hallway that led to the office. So a Twenty-second Century high school was a place where a teacher carried a pistol and a tear-gas projector and a sleep-gas gun, and had a bodyguard, and still walked in danger of his life from armed 'teen-age hooligans. It was meaningless to ask whose fault it was. There had been the World Wars, and the cold-war interbellum periods—rising birth rates, huge demands on the public treasury for armaments, with the public taxed to the saturation point, and no money left for the schools. There had been fantastic "Progressive" education experiments—even in the 'Fifties of the Twentieth Century, in the big cities, children were being pushed through grade school without having learned to read. And when there had been money available for education, school boards had insisted on spending it for audio-visual equipment, recordings, films, anything but textbooks. And there had been that lunatic theory that children should be taught to read by recognizing whole words instead of learning the alphabet. And more and more illiterates had been shoved out of the schools, into a world where radio and television and moving pictures were supplanting books and newspapers, and more and more children of illiterates

had gone to school without any desire or incentive to learn to read. And finally, the illiterates had become illiterates, and literacy had become Literacy.

And now, the Associated Fraternities of Literates had come to monopolize the ability to read and write, and a few men like William R. Lancedale, with a handful of followers like Ralph N. Prestonby, were trying—

The gleaming cleanliness of the corridor, as always, heartened Prestonby a little; it was a trophy of victory from his first two days at Mineola High School, three years ago. He remembered what they had looked like when he had first seen them.

"This school is a pig pen!" he had barked at the janitorial force. "And even if they are illiterates, these children aren't pigs; they deserve decent surroundings. This school will be cleaned, immediately, from top to bottom, and it'll be kept that way."

The janitors, all political appointees, Independent-Conservative party-hacks, secure in their jobs, had laughed derisively. The building superintendent, without troubling to rise, had answered him:

"Young man, you don't want to get off on the wrong foot, here," he had said. "This here's the way this school's always been run, an' it's gonna take a lot more than you to change it."

The fellow's name, he recalled, was Kettner; Lancedale had given him a

briefing which had included some particulars about him. He was an Independent-Conservative ward-committeeman. He had gotten his present job after being fired from his former position as mailman for listening to other peoples' mail with his pocket recorder-reproducer.

"Yetsko," he had said. "Kick this bum out on his face."

"You can't get away with—" Kettner had begun. Yetsko had yanked him out of his chair with one hand and started for the door with him.

"Just a moment, Yetsko," he had said.

Thinking that he was backing down, they had all begun grinning at him.

"Don't bother opening the door," he had said. "Just kick him out."

After the third kick, Kettner had gotten the door open, himself; the fourth kick sent him across the hall to the opposite wall. He pulled himself to his feet and limped away, never to return. The next morning, the school was spotless. It had stayed that way.

Beside him, Yetsko must also have returned mentally to the past.

"Looks better now than it did when we first saw it, captain," he said.

"Yes. It didn't take us as long to clean up this mess as it did to clean up that mutinous guards company in Pittsburgh. But when we cleaned

that up, it stayed cleaned. This is like trying to bail out a boat with a pitchfork."

"Yeah. I wish we'dda stayed in Pittsburgh, captain. I wish we'd never seen this place!"

"So do I!" Prestonby agreed, heartily.

No, he didn't, either. If he'd never have come to Mineola High School, he'd never have found Claire Pelton.

Sitting down again at the breakfast table with her father, Claire levered another cigarette out of the Readilit and puffed at it with exaggeratedly bored slowness. She was still frightened. Ray shouldn't have done what he did, even if he had furnished a plausible explanation. The trouble with plausible explanations was having to make them. Sooner or later, you made too many, and then you made one that wasn't so plausible, and then all the others were remembered, and they all looked phony. And why had the Senator had to mention Ralph? Was he beginning to suspect the truth about that, too?

I hope not! she thought desperately. If he ever found out about that, it'd kill him. Just kill him, period!

Mrs. Harris must have turned off the video, after they had gone up to the landing stage. To cover her nervousness, she reached up and snapped it on again. The screen lit, and from it a young man with dark eyes under

bushy black brows was shouting angrily:

"... Most obvious sort of conspiracy! If the Radical-Socialist Party leaders, or the Consolidated Illiterates' Organization Political Action Committee, need any further evidence of the character of their candidate and idolized leader, Chester Pelton, the treatment given to Pelton's candidacy by Literate First Class Elliot C. Mongery, this morning, ought to be sufficient to remove the scales from the eyes of the blindest of them. I won't state, in so many words, that Chester Pelton's sold out the Radical-Socialists and the Consolidated Illiterates' Organization to the Associated Fraternities of Literates, because, since no witness to any actual transfer of money can be found, such a statement would be libelous—provided Pelton had nerve enough to sue me."

"Why, you dirty misbegotten illegitimate—!" Pelton was on his feet. His hand went to his hip, and then, realizing that he was unarmed and, in any case, confronted only by an electronic image, he sat down again.

"Pelton's been yapping for socialized Literacy," the man on the screen continued. "I'm not going back to the old argument that any kind of socialization is only the thin edge of the wedge which will pry open the pit of horrors from which the world has climbed since the Fourth World War. If you don't realize that

now, it's no use for me to repeat it again. But I will ask you, do you realize, for a moment, what a program of socialized Literacy would mean, apart from the implications of any kind of socialization? It would mean that inside of five years, the Literates would control the whole government. They control the courts, now—only a Literate can become a lawyer, and only a lawyer can become a judge. They control the armed forces—only a Literate can enter West Point or Fort MacKenzie or Chapultepec or White Sands or Annapolis. And, if Chester Pelton's socialization scheme goes into effect, there will be no branch of the government which will not be completely under the control of the Associated Fraternities of Literates!"

The screen went suddenly dark. Her father turned, to catch her with her hand still on the switch.

"Put it back on; I want to hear what that lying pimp of a Slade Gardner's saying about me!"

"Phooy; you'd have shot it out, yourself, if you'd had your gun on. I saw you reaching for it. Now be quiet, and take it easy," she ordered.

He reached toward the Readilit for a cigarette, then his hand stopped. His face was contorted with pain; he gave a gasp of suffocation.

Claire cried in dismay: "You're not going to have another of those attacks? Where are the nitrocaine bulbs?"

"Don't . . . have any . . . here. Some at the office, but—"

"I told you to get more," she accused.

"Oh, I don't need them, really." His voice was steadier, now; the spasm of pain had passed. He filled his coffee cup and sipped from it. "Turn on the video again, Claire. I want to hear what that Gardner's saying."

"I will not! Don't you have people at party headquarters monitoring this stuff? Well, then. Somebody'll prepare an answer, if he needs answering."

"I think he does. A lot of these dumbos'll hear that and believe it. I'll talk to Frank. He'll know what to do."

Frank again. She frowned.

"Look, Senator; you think Frank Cardon's your friend, but I don't trust him. I never could," she said. "I think he's utterly and entirely unscrupulous. Amoral, I believe, is the word. Like a savage, or a pirate, or one of the old-time Nazis or Communists."

"Oh, Claire!" her father protested. "Frank's in a tough business—you have no idea the lengths competition goes to in the beer business—and he's been in politics, and dealing with racketeers and labor unions, all his life. But he's a good sound Illiterate—family Illiterate for four generations, like ours—and I'd trust him with anything. You heard this fellow

Mongery—I always have to pause to keep from calling him Mongrel—saying that I deserved the credit for pulling the Radicals out of the mud and getting the party back on the tracks. Well, I couldn't have begun to do it without Frank Cardon."

Frank Cardon stood on the sidewalk, looking approvingly into the window of O'Reilly's Tavern, in which his display crew had already set up the spread for the current week. On either side was a giant six-foot replica, in black glass, of the Cardon bottle, in the conventional shape accepted by an Illiterate public as containing beer, bearing the red Cardon label with its pictured bottle in a central white disk. Because of the heroic size of the bottles, the pictured bottle on the label bore a bottle bearing a label bearing a bottle bearing a bottle on a label. . . . He counted eight pictured bottles, down to the tiniest dot of black. There were four-foot bottles next to the six-foot bottles, and three-foot bottles next to them, and, in the middle background, a life-size tri-dimensional picture of an almost nude and incredibly pulchritudinous young lady smiling in invitation at the passing throng and extending a foaming bottle of Cardon's in her hand. Aside from the printed trademark-registry statements on the labels, there was not a printed word visible in the window.

He pushed through the swinging

doors and looked down the long room, with the chairs still roosting sleepily on the tables, and made a quick count of the early drinkers, two thirds of them in white smocks and Sam Browne belts, obviously from Literates' Hall, across the street. Late drinkers, he corrected himself mentally; they'd be the night shift, having their drinks before going home.

"Good morning, Mr. Cardon," the bartender greeted him. "Still drinking your own?"

"Hasn't poisoned me yet," Cardon told him. "Or anybody else." He folded a C-bill accordion-wise and set it on edge on the bar. "Give everybody what they want."

"Drink up, gentlemen, and have one on Mr. Cardon," the bartender announced, then lowered his voice. "O'Reilly wants to see you. About—" He gave a barely perceptible nod in the direction of the building across the street.

"Yes; I want to see him, too." Cardon poured from the bottle in front of him, accepted the thanks of the house, and, when the bartender brought the fifteen-dollars-odd change from the dozen drinks, he pushed it back.

He drank slowly, looking around the room, then set down his empty glass and went back, past two doors which bore pictured half-doors revealing, respectively, masculine-trousered and feminine-stockinged ankles, and opened the unmarked office door

beyond. The bartender, he knew, had pushed the signal button; the door was unlocked, and, inside, O'Reilly—baptismal name Luigi Orelli—was waiting.

"Chief wants to see you, right away," the saloon keeper said.

The brewer nodded. "All right. Keep me covered; don't know how long I'll be." He crossed the room and opened a corner-cupboard, stepping inside.

The corner cupboard, which was an elevator, took him to a tunnel below the street. Across the street, he entered another elevator, set the indicator for the tenth floor, and ascended. As the car rose, he could feel the personality of Frank Cardon, illiterate brewer, drop from him, as though he were an actor returning from the stage to his dressing room.

The room into which he emerged was almost that. There was a long table, at which two white-smocked Literates drank coffee and went over some papers; a third Literate sprawled in a deep chair, resting; at a small table, four men in black shirts and leather breeches and field boots played poker, while a fifth, who had just entered and had not yet removed his leather helmet and jacket or his weapons belt, stood watching them.

Cardon went to a row of lockers along the wall, opened one, and took out a white smock, pulling it over his head and zipping it up to the throat. Then he buckled on a Sam Browne

with its tablet holster and stylus gas projector. The Literate sprawling in the chair opened one eye.

"Hi, Frank. Feels good to have them on again, doesn't it?"

"Yes. Clean," Cardon replied. "It'll be just for half an hour, but—"

He passed through the door across from the elevator, went down a short hall, and spoke in greeting to the leather-jacketed storm trooper on guard outside the door at the other end.

"Mr. Cardon," the guard nodded. "Mr. Lancedale's expecting you."

"So I understand, Bert."

He opened the door and went through. William R. Lancedale rose from behind his desk and advanced to greet him with a quick handshake, guiding him to a chair beside the desk. As he did, he sniffed and raised an eyebrow.

"Beer this early, Frank?" he asked.

"Morning, noon, and night, chief," Cardon replied. "When you said this job was going to be dangerous, I didn't know you meant that it would lead straight to an alcoholic's grave."

"Let me get you a cup of coffee, and a cigar, then." The white-haired Literate executive resumed his seat, passing a hand back and forth slowly across the face of the commo, the diamond on his finger twinkling, and gave brief instructions. "And just relax, for a minute. You have a tough job, this time, Frank."

They were both silent as a novice Literate bustled in with coffee and individually-sealed cigars.

"At least, you're not one of these plain-living-and-right-thinking fanatics, like Wilton Joyner and Harvey Graves," Cardon said. "On top of everything else, that I could not take."

Lancedale's thin face broke into a smile, little wrinkles putting his mouth in parentheses. Cardon sampled the coffee, and then used a Sixteenth Century Italian stiletto from Lancedale's desk to perforate the end of his cigar.

"Much as I hate it, I'll have to get out of here as soon as I can," he said. "I don't know how long O'Reilly can keep me covered, down at the tavern—"

Lancedale nodded. "Well, how are things going, then?"

"First of all, the brewery," Cardon began.

Lancedale consigned the brewery to perdition. "That's just your cover; any money it makes is purely irrelevant. How about the election?"

"Pelton's in," Cardon said. "As nearly in as any candidate ever was before the polls opened. Three months ago, the Independents were as solid as Gibraltar used to be. Today, they look like Gibraltar after that H-bomb hit it. The only difference is, they don't know what hit them, yet."

"Hamilton's campaign manager

does," Lancedale said. "Did you hear his telecast, this morning?"

Cardon shook his head. Lancedale handed over a little half-inch, thirty-minute, record disk.

"All you need is the first three or four minutes," he said. "The rest of it is repetition."

Cardon put the disk in his pocket recorder and set it for play-back, putting the plug in his ear. After a while, he shut it off and took out the ear plug.

"That's bad! What are we going to do about it?"

Lancedale shrugged. "What are you going to do?" he countered. "You're Pelton's campaign manager—Heaven pity him."

Cardon thought for a moment. "We'll play it for laughs," he decided. "Some of our semantics experts could make the joke of the year out of it by the time the polls open tomorrow. The Fraternities bribing their worst enemy to attack them, so that he can ruin their business; who's been listening to a tape of 'Alice in Wonderland' at Independent-Conservative headquarters?"

"That would work," Lancedale agreed. "And we can count on our friends Joyner and Graves to give you every possible assistance with their customary bull-in-a-china-shop tactics. I suppose you've seen these posters they've been plastering around: *If you can read this, Chester*

Pelton is your sworn enemy! A vote for Pelton is a vote for your own enslavement!"

"Naturally. And have you seen the telecast we've been using—a view of it, with a semantically correct spoken paraphrase?"

Lancedale nodded. "And I've also noticed that those posters have been acquiring different obscene crayon-drawings, too. That's just typical of the short-range Joyner-Graves mentality. Why, they've made more votes for Pelton than he's made for himself. Is it any wonder we're convinced that people like that aren't to be trusted to formulate the future policy of the Fraternities?"

"Well . . . they've proved themselves wrong. I wonder, though, if we can prove ourselves right, in the long run. There are times when this thing scares me, chief. If anything went wrong—"

"What, for instance?"

"Somebody could get to Pelton." Cardon made a stabbing gesture with the stiletto, which he still held. "Maybe you don't really know how hot this thing's gotten. What we had to cut out of Mongery's report, this morning—"

"Oh, I've been keeping in touch," Lancedale understated gently.

"Well then. If anything happened to Pelton, there wouldn't be a Literate left alive in this city twelve hours later. And I question whether or not Graves and Joyner know that."

"I think they do. If they don't, it's not because I've failed to point it out to them. Of course, there are the Independent-Conservative grafters; a lot of them are beginning to hear jail doors opening for them, and they're scared. But I think routine body-guarding ought to protect Pelton from them, or from any isolated fanatics."

"And there is also the matter of Pelton's daughter, and his son," Cardon said. "We know, and Graves and Joyner know, and I assume that Slade Gardner knows, that they can both read and write as well as any Literate in the Fraternities. Suppose that got out between now and the election?"

"And that could not only hurt Pelton, but it would expose the work we've been doing in the schools," Lancedale added. "And even inside the Fraternities, that would raise the devil. Joyner and Graves don't begin to realize how far we've gone with that. They could kick up a simply hideous row about it!"

"And if Pelton found out that his kids are Literates—*Woooo!*" Cardon grimaced. "Or what we've been doing to him. I hope I'm not around when that happens. I'm beginning to like the cantankerous old bugger."

"I was afraid of that," Lancedale said. "Well, don't let it interfere with what you have to do. Remember, Frank; the Plan has to come first, always."

He walked with O'Reilly to the street door, talking about tomorrow's election; after shaking hands with the saloon keeper, he crossed the sidewalk and stepped onto the beltway, moving across the strips until he came to the twenty m.p.h. strip. The tall office buildings of upper Yonkers Borough marched away as he stood on the strip, appreciatively puffing at Lance-dale's cigar. The character of the street changed; the buildings grew lower, and the quiet and fashionable ground-floor shops and cafés gave place to bargain stores, their audio-advertisers whooping urgently about improbable prices and offerings, and garish, noisy, crowded bars and cafeterias blaring recorded popular music. There was quite a bit of political advertising in evidence—huge pictures of the two major senatorial candidates. He estimated that Chester Pelton's bald head and bulldog features appeared twice for every one of Grant Hamilton's white locks, old-fashioned spectacles and self-satisfied smirk.

Then he came to the building on which he had parked his 'copter, and left the beltway, entering and riding up to the landing stage on the helical escalator. There seemed to have been some trouble; about a dozen Independent-Conservative storm troopers, in their white robes and hoods, with the fiery-cross emblem on their breasts, were bunched together, most of them with their right hands inside their

bosoms, while a similar group of Radical-Conservative storm troopers, with their black sombreros and little black masks, stood watching them and fingering the white-handled pistols they wore in pairs on their belts. Between the two groups were four city policemen, looking acutely unhappy.

The group in the Lone Ranger uniforms, he saw, were standing in front of a huge tri-dimensional animated portrait of Chester Pelton. As he watched, the pictured candidate raised a clenched fist, and Pelton's recorded and amplified voice thundered:

"Put the Literates in their place! Our servants, not our masters!"

He recognized the group leader of the Radical-Socialists—the masks were too small to be more than token disguises—and beckoned to him, at the same time walking toward his 'copter. The man in black with the white-handled pistols followed him, spurs jingling.

"Hello, Mr. Cardon," he said, joining him. "Nothing to it. We got a tip they were coming to sabotage Big Brother, over there. Take out our sound-recording, and put in one of their own, like they did over in Queens, last week. The town clowns got here in time to save everybody's face, so there wasn't any shooting. We're staying put till they go, though."

"Put the Literates in their place! Our servants, not our masters!" the

huge tridianimate bellowed.

Over in Queens, the Independents had managed to get at a similar tridianimate, had taken out the record, and had put in one: *I am a lying fraud! Vote for Grant Hamilton and liberty and sound government!*

"Smart work, Goodkin," he approved. "Don't let any of your boys start the gunplay. The city cops are beginning to get wise to who's going to win the election, tomorrow, but don't antagonize them. But if any of those Ku Kluxers tries to pull a gun, don't waste time trying to wing him. Just hold on to that fiery something-or-other on his chest and let him have it, and let the coroner worry about him."

"Yeah. With pleasure," Goodkin replied. "You know, that nightshirt thing they wear is about the stupidest idea for a stormtroop uniform I ever saw. Natural target in a gunfight, and in a rough-and-tumble it gets them all tangled up. Ah, there go a couple of coppers to talk to them; that's what they've been waiting on. Now they can beat it without looking like they been run out by our gang."

Cardon nodded. "Tell your boys to stay around for a while; they may expect you to leave right after they do, and then they'll try to slip back. You did a good job; got here promptly. Be seeing you, Goodkin."

He climbed into his own 'copter and started the motor.

"Put the Literates in their place!"

the tri-dimensional colossus roared triumphantly after the retreating Independents. "*Our servants, not our masters!*"

At eight thousand, he got the 'copter onto the lower Manhattan beam and relaxed. First of all, he'd have to do something about answering Slade Gardner's telecast propaganda. That stuff was dangerous. The answer ought to go on the air by noon, and should be stepped up through the afternoon. First as a straight news story; Elliot Mongery had fifteen minutes, beginning at 1215—no, that wouldn't do. Mongery's sponsor for that time was Atomflame Heaters, and Atomflame was a subsidiary of Canada Northwest Fissionables, and Canada Northwest was umbilicus-deep in that Kettle River lease graft that Pelton had sworn to get investigated as soon as he took office. Professional ethics wouldn't allow Mongery to say anything in Pelton's behalf on Atomflame's time. Well, there was Guthrie Parham, he came on at 1245, and his sponsor was all right. He'd call Parham and tell him what he wanted done.

The buzzer warned him that he was approaching the lower Manhattan beacon; he shifted to manual control, dropped down to the three-thousand-foot level, and set his selector beam for the signal from Pelton's Purchasers' Paradise. Down toward the tip of the island, in the section that had



been rebuilt after that Stalin Mark XV guided missile had gotten through the counter-rocket defenses in 1987, he could see the quadrate cross of his goal, with public landing stages on each of the four arms, and the higher central block with its landing stage for freight and store personnel. Above the four public stages, helicopters swarmed like May flies—May flies which had mutated and invented ritual or military drill or choreography—coming in in four streams to the tips of the arms and rising vertically from the middle. There was about ten times the normal amount of traffic for this early in the morning. He wondered, briefly, then remembered, and cursed. That infernal sale!

Grudgingly, he respected Russell Latterman's smartness, and in consequence, the ability of Wilton Joyner and Harvey Graves in selecting a good agent to plant in Pelton's store. Latterman gave a plausible impersonation of the Illiterate businessman, loyal Prime Minister of Pelton's commercial empire, Generalissimo in the perpetual war against Macy & Gimbel's. From that viewpoint, the sale was excellent business—Latterman had gotten the jump on all the other department stores for the winter fashions and fall sports trade. He had also turned the store into a madhouse at the exact time when Chester Pelton needed to give all his attention to the election.

Pressing the button that put on his private recognition signal, he rose above the incoming customers and began to drop toward the private

landing stage, circling to get a view of the other four stages. Maybe the sale could be turned to some advantage, at that. A free souvenir with each purchase, carrying a Pelton-for-Senator picture-message—

He broke off, peering down at the five-hundred-foot-square landing stage above the central block, then brought his 'copter swooping down rapidly. The white-clad figures he had seen swarming up the helical escalator were not wearing the Ku Klux robes of the Independent-Conservative storm troops, as he had first feared—they were in Literate smocks, and among them were the black leather jackets and futuristic helmets of their guards. They were led, he saw, by Stephen S. Bayne, the store's Chief Literate; with him were his assistant, Literate Third Class Roger B. Feinberg, and the novices carrying books and briefcases and cased typewriters, and the guards, and every Literate employed in the store. Four or five men in ordinarily vivid-colored business suits were obviously expostulating about something. As he landed and threw back the transparent canopy, he could hear a babel of voices, above which Feinberg was crying: "Unfair! Unfair! Unfair to Organized Literacy!"

He jumped out and hurried over.

"But you simply can't!" a white-haired man in blue-and-orange business clothes was protesting. "If you do, the Associated Fraternities'll be

liable for losses we incur; you know that!"

Bayne, his thin face livid with anger—and also, Cardon noticed, with what looked like a couple of fresh bruises—ignored him. Feinberg broke off his chant of "Unfair! Unfair!" long enough to answer:

"A Literate First Class has been brutally assaulted by the Illiterate owner of this store. Literate service for this store is, accordingly, being discontinued, pending a decision by the Grand Council of the local Fraternity."

Cardon grabbed the blue-and-orange clad man and dragged him to one side.

"What happened, Hutschnecker?" he demanded.

"They're walking out on us," Hutschnecker told him, unnecessarily. "The boss had a fight with Bayne; knocked him down a couple of times. Bayne tried to pull his tablet gun, and I grabbed it away from him, and somebody else grabbed Pelton before he could pull his, and a couple of store cops got all the other Literates in the office covered. Then Bayne put on the general-address system and began calling out the Literates—"

"Yes, but why did Pelton beat Bayne up?"

"Bayne made a pass at Miss Claire. I wasn't there when it happened; she came into the office—"

Cardon felt his face tighten into a frown of perplexity. That wasn't like

Literate First Class Stephen S. Bayne. He made quite a hobby of pinching salesgirls behind the counter which was one thing; the boss' daughter was quite another.

"Where's Latterman?" he asked, looking around.

"Down in the office, with the others, trying to help Mr. Pelton. He's had another of those heart attacks—"

Cardon swore and ran for the descending escalator, running down the rotating spiral to the executive floor and jumping off into the gawking mob of Illiterate clerks crowded in the open doors of Pelton's office. He hit and shoved and elbowed and cursed them out of the way, and burst into the big room beyond, and then, for a moment, he was almost sorry he had come.

Pelton was slumped in his big relaxer chair, his face pale and twisted in pain, his breath coming in feeble gasps. His daughter was beside him, her blond head bent over him; Russell Latterman was standing to one side, watching intently. For an instant, Cardon was reminded of a tomcat watching a promising mouse hole.

"Claire!" Cardon exploded, "give him a nitrocaïne bulb. Why are you all just standing around?"

Claire turned. "There are none," she said, looking at him with desperate eyes. "The box is empty; he must have used them all."

He shot a quick glance at Latterman, catching the sales manager before he could erase a look of triumph

from his face. Things began to add up. Latterman, of course, was the undercover man for Wilton Joyner and Harvey Graves and the rest of the Conservative faction at Literates' Hall, just as he, himself, was Lancedale's agent. Obsessed with immediate advantages and disadvantages, the Joyner-Graves faction wanted to secure the re-election of Grant Hamilton, and the way things had been going in the past two months, only Chester Pelton's death could accomplish that. Latterman had probably thrown out Pelton's nitrocaïne capsules and then put Bayne up to insulting Pelton's daughter, knowing that a fit of rage would bring on another heart attack, which could be fatal without the medicine.

"Well, send for more!"

"The prescription's in the safe," she said faintly.

The office safe was locked, and only a Literate could open it. The double combination was neatly stenciled on the door, the numbers spelled out as words and the letters spelled in phonetic equivalents. All three of them—himself, Claire, and Russell Latterman—could read them. None of them dared admit it. Latterman was fairly licking his chops in anticipation. If Cardon opened the safe, Pelton's campaign manager stood convicted as a Literate. If Claire opened it, the gaggle of Illiterate clerks in the doorway would see, and speedily spread

the news, that the daughter of the arch-foe of Literacy was herself able to read. Maybe Latterman hadn't really intended his employer to die. Maybe this was the situation he had really intended to contrive.

Chester Pelton couldn't be allowed to die. If Grant Hamilton were returned to the Senate, the long-range planning of William Lancedale would suffer a crushing setback, and the public reaction would be catastrophic. *The Plan comes first*, Lancedale had told him. He made his decision, and then saw that he hadn't needed to make it. Claire had straightened, left her father, crossed quickly to the safe, and was kneeling in front of it, her back stiff with determination, her fingers busy at the dials, her eyes going from them to the printed combination and back again. She swung open the door, skimmed through the papers inside, unerringly selected the prescription, and rose.

"Here, Russ; go get it filled at once," she ordered. "And hurry!"

Oh, no, you don't, Cardon thought. One chance is enough for you, Russ. He snatched the prescription from her and turned to Latterman.

"I'll get it," he told the sales manager. "You're needed for the sale; stay on the job here."

"But with the Literates walked out, we can't—"

Cardon blazed: "Do I have to teach you your business? Have a sample of each item set aside at the counter, and

pile sales slips under it. And for unique items, just detach the tag and put it with the sales slip. Now get out of here, and get cracking with it!" He picked up the pistol that had been taken from Pelton when he had tried to draw it on Bayne, checking the chamber and setting the safety. "Know how to use this?" he asked Claire. "Then hang onto it, and stay close to your father. This wasn't any accident, it was a deliberate attempt on his life. I'll have a couple of store cops sent in here; see that they stay with you."

He gave her no chance to argue. Pushing Latterman ahead of him, he drove through the mob of clerks outside the door.

". . . Course she can; didn't you see her open the safe?" he heard. ". . . Nobody but a Literate—" "Then she's a Literate, herself!"

A couple of centuries ago, they would have talked like that if it had been discovered that the girl were pregnant; a couple of centuries before that, they would have been equally horrified if she had been discovered to have been a Protestant, or a Catholic, or whatever the locally unpopular religion happened to be. By noon, this would be all over Penn-Jersey-York; coming on top of Slade Gardner's accusations—

He ran up the spiral escalator, stumbling and regaining his footing as he left it. Bayne and his striking Liter-

ates were all gone; he saw a sergeant of Pelton's store police and went toward him, taking his spare identity-badge from his pocket.

"Here," he said, handing it to the sergeant. "Get another officer, and go down to Pelton's office. Show it to Miss Pelton, and tell her I sent you. There's been an attempt on Chester Pelton's life; you're to stay with him. Use your own judgment, but don't let anybody, and that definitely includes Russell Latterman, get at him. If you see anything suspicious, shoot first and ask questions afterwards. What's your name, sergeant?"

"Coccozello, sir. Guido Coccozello."

"All right. There'll be a medic or a pharmacist—a Literate, anyhow—with medicine for Mr. Pelton. He'll ask for you, by name, and mention me. And there'll be another Literate, maybe; he'll know your name, and use mine. Hurry, now, sergeant."

He jumped into his 'copter, pulled forward the plexiglass canopy, and took off vertically to ten thousand feet, then, orienting himself, swooped downward toward a landing stage on the other side of the East River, cutting across traffic levels with an utter contempt for regulations.

The building on which he landed was one of the principal pharmacies; he spiraled down on the escalator to the main floor and went directly to the Literate in charge, noticing that he wore on his Sam Browne not only the badges of retail-merchandising, phar-

macist and graduate chemist but also that of medic-in-training. Snatching a pad and pencil from a counter, he wrote hastily: *Your private office, at once; urgent and important.*

Looking at it, the Literate nodded in recognition of Cardon's Literacy.

"Over this way, sir," he said, guiding Cardon to his small cubicle office.

"Here." Cardon gave him the prescription. "Nitrocaine bulbs. They're for Chester Pelton; he's had a serious heart attack. He needs these with all speed. I don't suppose I need tell you how many kinds of hell will break loose if he dies now and the Fraternities are accused, as the Illiterates' Organization will be sure to, of having had him poisoned."

"Who are you?" the Literate asked, taking the prescription and glancing at it. "That,"—he gestured toward Cardon's silver-laced black Mexican jacket—"isn't exactly a white smock."

Cardon had his pocket recorder in his hand. He held it out, pressing a concealed stud; the stylus-and-tablet insigna glowed redly on it for a moment, then vanished. The uniformed Literate nodded.

"Fill this exactly; better do it yourself, to make sure, and take it over to Pelton's yourself. I see you have a medic-trainee's badge. Ask for Sergeant Coccozello, and tell him Frank Cardon sent you." The Literate, who had not recognized him before, opened his eyes at the name and whistled softly. "And fix up a sedative to keep

him quiet for not less than four nor more than six hours. Let me use your visiphone for a while, if you please."

The man in the Literate smock nodded and hurried out. Cardon dialed William R. Lancedale's private number. When Lancedale's thin, intense face appeared on the screen, he reported swiftly.

"The way I estimate it," he finished, "Latterman put Bayne up to making a pass at the girl, after having thrown out Pelton's nitrocaine bulbs. Probably told the silly jerk that Claire was pining away with secret passion for him, or something. Maybe he wanted to kill Pelton; maybe he just wanted this to happen."

"I assume there's no chance of stopping a leak?"

Cardon laughed with mirthless harshness. "That, I take it, was rhetorical."

"Yes, of course." Lancedale's face assumed the blank expression that went with a pause for semantic re-integration. "Can you cover yourself for about an hour?"

"Certainly. 'Copter trouble. Visits to campaign headquarters. An appeal on Pelton's behalf for a new crew of Literates for the store—"

"Good enough. Come over. I think I can see a way to turn this to advantage. I'm going to call for an emergency session of the Grand Council this afternoon, and I'll want you sitting in on it; I want to talk to you about plans now." He considered for a

moment. "There's too much of a crowd at O'Reilly's, now; come the church way."

Breaking the connection, Cardon dialed again. A girl's face, over a Literate Third Class smock, appeared in the screen; a lovely golden voice chimed at him:

"Mineola High School; good morning, sir."

"Good morning. Frank Cardon here. Let me talk, at once, to your principal, Literate First Class Prestonby."

Ralph Prestonby cleared his throat, slipped a master disk into the recording machine beside his desk, and pressed the start button.

"Dear Parent or Guardian," he began. "Your daughter, now a third-year student at this school, has reached the age of eligibility for the Domestic Science course entitled, 'How To Win and Hold a Husband.' Statistics show that girls who have completed this valuable course are sooner, longer, and happier married than those who have not enjoyed its advantages. We recommend it most highly.

"However, because of the delicate nature of some of the visual material used, your consent is required. You can attach such consent to this disk by running it for at least ten seconds after the sign-off and then switching from 'Play' to 'Transcribe.' Kindly include your full name, as well as your daughter's, and place your thumbprint on the opposite side of the disk. Very

sincerely yours, Literate First Class
Ralph C. Prestonby, Principal."

He put the master disk in an envelope, checked over a list of names and addresses of parents and girl students, and put that in also. He looked over the winter sports schedule, and signed and thumbprinted it. Then he loaded the recorder with his morning's mail, switched to "Play," and started it. As he listened, he blew smoke rings across the room and toyed with a dagger, made from a file, which had been thrown down the central light-well at him a few days before. The invention of the pocket recorder, which put a half-hour's conversation on a half-inch disk, had done more to slow down business and promote inane correspondence than anything since the earlier inventions of shorthand, typewriters and pretty stenographers. Finally, he cleared the machine, dumping the whole mess into a basket and carrying it out to his secretary.

"Miss Collins, take this infernal rubbish and have a couple of the girls divide it between them, play it off, and make a digest of it," he said. "And here. The sports schedule, and this parental-consent thing on the husband-trapping course. Have them taken care of."

"This stuff," Martha Collins said, poking at the pile of letter disks. "I suppose about half of it is threats, abuse and obscenities, and the other half is from long-winded bores with idiotic suggestions and ill-natured gripes. I'll

use that old tag line, again — 'hoping you appreciate our brevity as much as we enjoyed yours —'"

"Yes. That'll be all right." He looked at his watch. "I'm going to make a personal building-tour, instead of using the TV. The animals are sort of restless, today. The election; the infantile compulsion to take sides. If you need me for anything urgent, don't use oral call. Just flash my signal, red-blue-red-blue, on the hall and classroom screens. Oh, Doug!"

Yetsko, his length of rubber hose under his arm, ambled out of Prestonby's private office, stopping to stub out his cigarette. The action reminded Prestonby that he still had his pipe in his mouth; he knocked it out and pocketed it. Together, they went into the hall outside.

"Where to, first, captain?" Yetsko wanted to know.

"Cloak-and-Dagger Department, on the top floor. Then we'll drop down to the shops, and then up through Domestic Science and Business and General Arts."

"And back here. We hope," Yetsko finished.

They took a service elevator to the top floor, emerging into a stockroom piled with boxes and crates and cases of sound records and cans of film and stacks of picture cards, and all the other impedimenta of Illiterate education. Passing through it to the other end, Prestonby unlocked a door, and

they went down a short hall, to where ten or fifteen boys and girls had just gotten off a helical escalator and were queued up at a door at the other end. There were two Literate guards in black leather, and a student-monitor, with his white belt and rubber truncheon, outside the door.

Prestonby swore under his breath. He'd hoped they'd miss this, but since they hadn't, there was nothing for it but to fall in at the tail of the queue. One by one, the boys and girls went up, spoke briefly to the guards and the student-monitor, and were passed through the door. Each time, one of the guards had to open it with a key. Finally, it was Prestonby's turn.

"B, D, F, H, J, L, N, P, R, T, V, X, Y," he recited to the guardians of the door.

"A, C, E, G, I, K, M, O, Q, S, U, W, Y," the monitor replied solemnly. "The inkwell is dry, and the book is dusty."

"But tomorrow, there will be writing and reading for all," Prestonby answered.

The guard with the key unlocked the door, and he and Yetsko went through, into an utterly silent sound-proofed room, and from it into an inner, noisy, room, where a recorded voice was chanting:

"Hat—*huh-ah-tuh*. H-a-t. Box—*buh-oh-ksss*. B-o-x. Gun—*guh-uh-nnn*. G-u-n. Girl—*guh-ih-rrr-lll*," while pictures were flashed on a screen at the front, and words appeared under them.

There were about twenty boys and girls, of the freshman-year age-bracket, at desk-seats, facing the screen. They'd started learning the alphabet when school had opened in September; now they had gotten as far as combining letters into simple words. In another month, they'd be as far as diphthongs and would be initiated into the mysteries of silent letters. Maybe sooner than that; he was finding that children who had not been taught to read until their twelfth year learned much more rapidly than the primary grade children in the Literate schools.

What he was doing here wasn't exactly illegal. It wasn't even against the strict letter of Fraternity regulations. But it had to be done clandestinely. What he'd have liked to have done would have been to have given every boy and girl in English I the same instruction this selected group was getting, but that would have been out of the question. The public would never have stood for it; the police would have had to intervene to prevent a riotous mob of Illiterates from tearing the school down brick by brick, and even if that didn't happen, the ensuing uproar inside the Fraternity would have blown the roof off Literates' Hall. Even Lancedale couldn't have survived such an explosion, and the body of Literate First Class Ralph N. Prestonby would have been found in a vacant lot the next morning. Even many of Lancedale's supporters would have turned on him in anger at this

sudden blow to the Fraternities' monopoly of the printed word.

So it had to be kept secret, and since adolescents in possession of a secret are under constant temptation to hint mysteriously in the presence of outsiders, this hocus-pocus of ritual and password and countersign had to be resorted to. He'd been in conspiratorial work of other kinds, and knew that there was a sound psychological basis for most of what seemed, at first glance, to be mere melodramatic claptrap.

He and Yetsko passed on through a door across the room, into another soundproofed room. The work of soundproofing and partitioning the old stockroom had been done in the last semester of his first year at Mineola High, by members of the graduating class of building-trades students, who had then gone their several ways convinced that they had been working on a set of music-class practice rooms. The Board of Education had never even found out about it. In this second room, a Literate teacher, one of the Lancedale faction, had a reading class of twenty-five or thirty. A girl was on her feet, with a book in her hand, reading from it:

"We are not sure of sorrow;
And joy was never sure;
Today will die tomorrow;
Time stoops to no man's lure;
And love, grown faint and fretful

With lips but half regretful
Sighs, and with eyes forgetful
Weeps that no loves endure."

Then she handed the book—it was the only copy—to the boy sitting in front of her, and he rose to read the next verse. Prestonby, catching the teacher's eye, nodded and smiled. This was a third-year class, of course, but from h-a-t spells hat to Swinburne in three years was good work.

There were three other classes, a total of little over a hundred students. There was no trouble; they were there for one purpose only—to learn. He spoke with one of the teachers, whose class was busy with a written exercise; he talked for a while to another whose only duty at the moment was to answer questions and furnish help to a small class who were reading silently from a variety of smuggled-in volumes.

"Only a hundred and twenty, out of five thousand," Yetsko said to him, as they were dropping down in the elevator by which they had come. "Think you'll ever really get anything done with them?"

"I won't. Maybe they won't," he replied. "But the ones they'll teach will. They're just a cadre; it'll take fifty years before the effects are really felt. But some day—"

The shops—a good half of the school was trades-training—were noisy and busy. Here Prestonby kept his hand on his gas-projector, and Yetsko had his rubber hose ready, either to strike

or to discard in favor of his pistol. The instructors were similarly on the alert and ready for trouble—he had seen penitentiaries where the guards took it easier. Carpentry and building trades. Machine shop. Welding. 'Copper and TV repair shops—he made a minor and relatively honest graft there, from the sale of rebuilt equipment. Even an atomic-equipment shop, though there was nothing in the place that would excite a Geiger more than the instructor's luminous-dial watch.

Domestic Science—Home Decorating, Home Handicrafts, Use of Home Appliances, Beautician School, Charm School. He and Yetsko sampled the products of the Cooking School, intended for the cafeteria, and found them edible if uninspired.

Business—classes in recording letters, using Illiterate business-machines, preparing Illiterate cards for same, filing recordings—always with the counsel, "When in doubt, consult a Literate."

General Arts—Spanish and French, from elaborate record players, the progeny of the old Twentieth Century Linguaphone. English, with recorded-speech composition, enunciation training, semantics, and what Prestonby called English Illiterature. The class he visited was drowsing through one of the less colorful sections of "Gone With The Wind." World History, with half the students frankly asleep through an audio-visual on the Feudal

System, with planted hints on how nice a revival of same would be, and identifying the clergy of the Middle Ages with the Fraternities of Literates. American History, with the class wide awake, since Custer's Massacre was obviously only moments away.

"Wantta bet one of those little cherubs doesn't try to scalp another before the day's out?" Yetsko whispered.

Prestonby shook his head. "No bet. Remember that film on the Spanish Inquisition, that we had to discontinue?"

It was then that the light on the classroom screen, which had been flickering green and white, suddenly began flashing Prestonby's wanted-at-office signal.

Prestonby found Frank Cardon looking out of the screen in his private office. The round, ordinarily cheerful, face was serious, but the innocent blue eyes were as unreadable as ever. He was wearing one of the new Mexican *charro*-style jackets, black laced with silver.

"I can't see all your office, Ralph," he said as Prestonby approached. "Are you alone?"

"Doug Yetsko's all," Prestonby said, and, as Cardon hesitated, added: "Don't be silly, Frank; he's my bodyguard. What could I be in that he wouldn't know all about?"

Cardon nodded. "Well, we're in a jam up to here." A handwave con-

veyed the impression that the sea of troubles had risen to his chin. He spoke at some length, describing the fight between Chester Pelton and Stephen S. Bayne, the Literate strike at Pelton's Purchasers' Paradise, Pelton's heart attack, and the circumstances of Claire's opening the safe. "So you see," he finished. "Maybe Latterman tried to kill Pelton, maybe he just tried to do what he did. I can't take chances either way."

Prestonby thought furiously. "You say Claire's alone at the store with her father?"

"And a couple of store cops, sterling characters with the hearts of lions and the brains of goldfish," Cardon replied. "And Russ Latterman, and maybe four or five Conservative goons he's managed to infiltrate into the store."

Prestonby was still thinking, aloud, now. "Maybe they did mean to kill Pelton; in that case, they'll try again. Or maybe they only wanted to expose Claire's literacy. It's hard to say what else they'd try—maybe kidnap her, to truth-drug her and use her as a guest-artist on a Conservative telecast. I'm going over to the store, now."

"That's a good idea, Ralph. If you hadn't thought of it, I was going to suggest it. Land on the central stage, ask for Sergeant Coccozello of the store police, and give my name. Even aside from everything else, it'd be a good idea to have somebody there who can read and dares admit it, till a new crew of Literates can get there. You

were speaking about the possibility of kidnaping; how about the boy? Ray?"

Prestonby nodded. "I'll have him come here to my office, and stay there till I get back; I'll have Yetsko stay with him." He turned to where the big man in black leather stood guard at the door. "Doug, go get Ray Pelton and bring him here. Check with Miss Collins for where he'd be, now." He turned back to the screen. "Anything else, Frank?"

"Isn't that enough?" the brewer-Literate demanded. "I'll call you at the store, after a while. 'Bye.'"

The screen darkened as Cardon broke the connection. Prestonby got to his feet, went to his desk, and picked up a pipe, digging out the ashes from the bowl with an ice pick that one of the teachers had taken from a sixteen-year-old would-be murderer. He checked his tablet gun, made sure that there was an extra loaded clip in the holster, and got two more spare clips from the arms locker. Then, to make sure, he called Pelton's store, talking for a while to the police sergeant Cardon had mentioned. By the time he was finished, the door opened and Yetsko ushered Ray Pelton in.

"What's happened?" the boy asked. "Doug told me that the Senator . . . my father . . . had another heart attack."

"Yes, Ray. I don't believe he's in any great danger. He's at the store, resting in his office." He went on to tell the boy what had happened, ex-

actly and in full detail. He was only fifteen, but already he had completed the four-year reading course and he could think a great deal more logically than seventy per cent of the people who were legally entitled to vote. Ray listened seriously, and proved Prestonby's confidence justified by nodding.

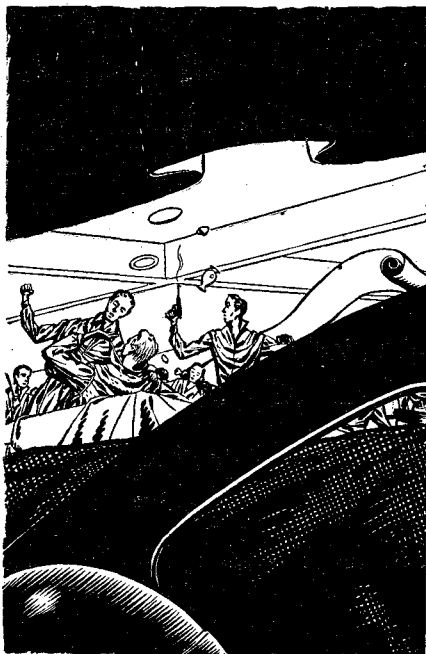
"Frame-up," he said succinctly. "Stinks like a glue factory of a put-up job. Something's going to happen to Russ Latterman, one of these days."

"I think you'd better let Frank Cardon take care of him, Ray," Prestonby advised. "I think there are more angles to this than he told me. Now, I'm going over to the store. Somebody's got to stay with Claire. I want you to stay here, in this room. If anybody sends you any message supposed to be from me, just ignore it. It'll be a trap. If I want to get in touch with you, I'll call you, with vision-image."

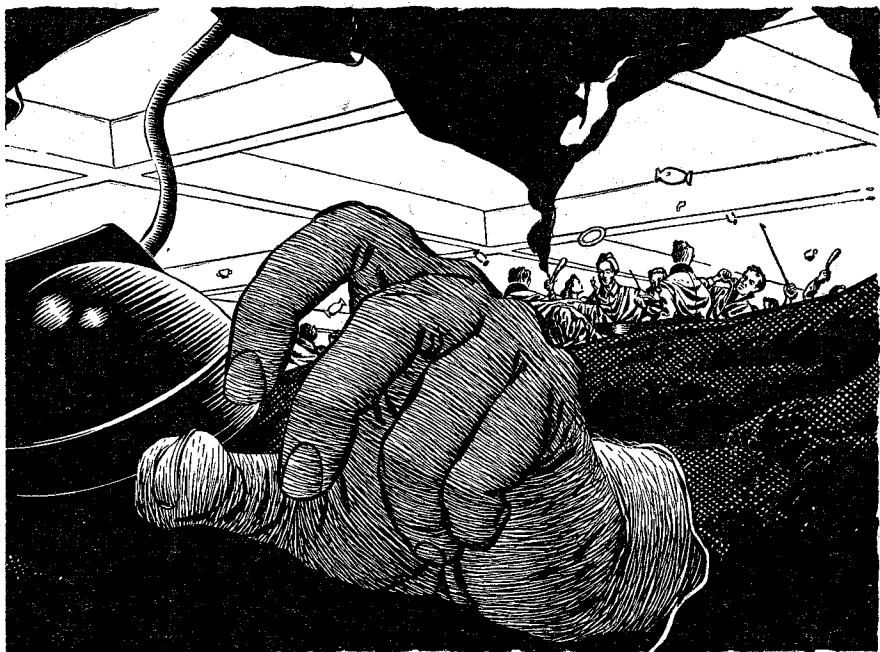
"Mean somebody might try to kidnap me, or Claire, to force the Senator to withdraw, or something?" Ray asked, his eyes widening.

"You catch on quickly, Ray," Prestonby commended him. "Doug, you stay with Ray till I get back. Don't let him out of your sight for an instant. At noon, have Miss Collins get lunches for both of you sent up; if I'm not back by fifteen-hundred, take him to his home, and stay with him there."

For half an hour, Frank Cardon made a flying tour of Radical-Socialist



borough headquarters. Even at the Manhattan headquarters, which he visited immediately after his talk with Prestonby, the news had already gotten out. The atmosphere of optimistic triumph which had undoubtedly followed Mongery's telecast and his report on the Trotter Poll, had evaporated. The Literate clerical help was gathered in a tight knot, obviously a little worried, and just as obviously enjoying the reaction. In smaller and constantly changing groups, the volunteers, the paid helpers, the dirt-squirters, the goon gangs, gathered, talking in worried or frightened or



angry voices. When Cardon entered and was recognized, there was a concerted movement toward him. His two regular bodyguards, both on leave from the Literate storm troops, moved quickly to range themselves on either side of him. With a gesture, he halted the others.

"Hold it!" he called. "I know what you're worried about. I was there when it happened, and saw everything."

He paused, to let them assimilate that, and continued: "Now get this, all of you! Our boss, and—if *he lives*—our next senator, was the victim of a

deliberate murder attempt, by Literate First Class Bayne, who threw out his supply of nitrocaïne bulbs and then goaded him into a heart attack which, except for his daughter, would have been fatal. Claire Pelton deserves the deepest gratitude of every Radical-Socialist in the state. She's a smart girl, and she saved the life of her father and our leader.

"But—she is *not* a Literate!" he cried loudly. "All she did was something any of you could have done—something I've done, myself, so that I won't be locked out of my own safe and have to wait for a Literate to

come and open it for me. She simply kept her eye on the Literates who were opening the safe, and learned the combination from the positions to which they turned the dial. And you believe, on the strength of that, that she's a Literate? The next thing, you'll be believing that professional liar of a Slade Gardner. And you call yourselves politicians!" He fairly gargled obscenities.

Looking around, he caught sight of a pair who seemed something less than impressed with his account of it. Joe West, thick-armed, hairy-chested, blue-jowled; Horace Yingling, thin and gangling. They weren't Radical-Socialist party people; they were from the Political Action Committee of the Consolidated Illiterates Organization, and their slogan was simpler and more to the point than Chester Pelton's—the only good Literate is a dead Literate. He tensed himself and challenged them directly.

"Joe; Horace. How about you? Satisfied the Pelton girl isn't a Literate, now?"

Yingling looked at West, and West looked back at him questioningly. Evidently the *suavitor in modo* was Yingling's province, and the *fortior in re* was West's.

"Yeh, sure, Mr. Cardon," Yingling said dubiously. "Now that you explain it, we see how it was."

It was worse than that in some of the other boroughs. One fanatic, imag-

ining that Cardon himself was a crypto-Literate, drew a gun. Cardon's guards disarmed him and beat him senseless. At another headquarters, some character was circulating about declaring that not only Claire Pelton but her younger brother, Ray, as well, were Literates. Cardon's two men hustled him out of the building, and, after about twenty minutes, returned alone. Cardon hoped that the body would not be found until after the polls closed, the next day.

Finally, leaving his guards with the 'copter at a public landing stage, he made his way, by devious routes, to William R. Lancedale's office, and found Lancedale at his desk, seeming not to have moved since he had showed his agent out earlier in the day.

"Well, we're in a nice puddle of something-or-other," Cardon greeted him. "On top of that Gardner telecast, this morning—"

"Guthrie Parham's taking care of that, and everything's going to be done to ridicule Gardner," Lancedale told him. "And even this business at the store can be turned to some advantage. Before we're through, we may gain more votes than we lose for Pelton. And we had an informal meeting—Joyner for Retail Merchandising, Starke for Grievance Settlements, and four or five others including myself, to make up a quorum. We had Bayne in, and heard his story of it, and we got a report from one of our stoolies in the store. Bayne

thought he was due for a commendation; instead, he got an eat-out. Of course, it was a fact that Pelton'd hit him, and we can't have Literates punched around, regardless of provocation. So we voted to fine Pelton ten million for beating Bayne up, and to award him ten million for losses resulting from unauthorized withdrawal of Literate services. We ordered a new crew of Literates to the store, and we exiled Bayne to Brooklyn, to something called Stillman's Used Copter and Junk Bazaar. For the next few months, the only thing he'll find that's round and pinchable will be second-hand tires. But don't be too hard on him; I think he did us a favor."

"You mean, starting a rift between Pelton and the Consolidated Illiterates' Organization, which we can widen after the election?"

"No. I hadn't thought of it that way, Frank," Lancedale smiled. "It's an idea worth keeping in mind, and we'll exploit it, later. What I was thinking about was the more immediate problem of the election—"

The buzzer on Lancedale's desk interrupted, and a voice came out of the commo box:

"Message, urgent and private, sir. Source named as Sforza."

Cardon recognized the name. Maybe the Independent-Conservatives have troubles, too, he thought hopefully. Then Lancedale's video screen became the frame for an almost un-

believably commonplace set of features.

"Sforza, sir," the man in the screen said. "Sorry I'm late, but I was able to get out of the building only a few minutes ago, and I had to make sure I wasn't wearing a tail. I have two new facts. First, the Conservatives have been bringing storm troops in from outside, from Philadelphia, and from Wilkes-Scranton, and from Buffalo. They are being concentrated in lower Manhattan, in plain clothes, with only concealed weapons, and carrying their hoods folded up under their coats. Second, I overheard a few snatches of conversation between two of the Conservative storm troop leaders, as follows: '... Start it in China ... thirteen-thirty,' and '... Important to make it appear either spontaneous or planned for business motives.'"

"Try to get us more information, as quickly as possible," Lancedale directed. "Obviously, we should know, by about thirteen hundred, what's being planned."

"Right, sir." Lancedale's spy at Independent-Conservative headquarters nodded and vanished from the screen.

"What does it sound like to you, Frank?" Lancedale asked.

"China is obviously a code-designation for some place in downtown Manhattan, where the Conservative goon gangs are being concentrated. The only thing I can say is that it probably

is not Chinatown. They'd either say 'Chinatown' and not 'China,' or they would use some code-designation that wasn't so close to the actual name," Cardon considered. "What they're going to start, at thirteen-thirty, which is only two hours and a half from now, is probably some kind of a riot."

"A riot which could arise from business motives," Lancedale added. "That sounds like the docks, or the wholesale district, or the garment district, or something like that." He passed his hand rapidly over the photoelectric eye of the commo box. "Get me Major Slater," he said; and, a little later, "Major, get a platoon out to Long Island, to Chester Pelton's home; have the place searched for possible booby traps, and maintain guard there till further notice. You'll have no trouble with the servants, they're all in our pay. That platoon must not, repeat not, wear uniform or appear to have any connection with the Fraternities. Put another platoon in Pelton's store. Concealed weapons, and plain clothes. They should carry their leather helmets in shopping bags, and roam about in the store, ostensibly shopping. And a full company, uniformed and armed with heavy weapons, alerted and ready for immediate 'copter movement." He went on to explain about the intelligence report and the conclusions drawn from it. The guards officer repeated back his instructions, and Lancedale broke the connection.

"Now, Frank," he said, "I told you that this revelation of Claire Pelton's Literacy can be turned to our advantage. There's to be a full Council meeting at thirteen hundred. Here's what I estimate Joyner and Graves will try to do, and here's what I'm going to do to counter it—"

A couple of men in the maroon uniform of Pelton's store police were waiting as Prestonby's 'copter landed on the top stage; one of them touched his cap-visor with his gas-billy in salute and said: "Literate Prestonby? Miss Pelton is expecting you; she's in her father's office. This way, if you please, sir."

He had hoped to find her alone, but when he entered the office, he saw five or six of the store personnel with her. Since opening her father's safe, she had evidently dropped all pretense of Illiteracy; there was a mass of papers spread on the big desk, and she was referring from one to another of them with the deft skill of a regular Fraternities Literate, while the others watched in fascinated horror.

"Wait a moment, Mr. Hutsch-necker," she told the white-haired man in the blue and orange business suit with whom she had been talking, and laid the printed price-schedule down, advancing to meet him.

"Ralph!" she greeted him. "Frank Cardon told me you were coming. I—"

For a moment, he thought of the

afternoon, over two years ago, when she had entered his office at the school, and he had recognized her as the older sister of young Ray Pelton.

"Professor Prestonby," she had begun, accusingly, "you have been teaching my brother, Raymond Pelton, to read!"

He had been prepared for that; had known that sooner or later there would be some minor leak in the security screen around the classrooms on the top floor.

"My dear Miss Pelton," he had protested pleasantly. "I think you've become overwrought over nothing. This pretense to Literacy is a phase most boys of Ray's age pass through; they do it just as they play air-pirates or hi-jackers a few years earlier. The usual trick is to memorize something heard from a record disk, and then pretend to read it from print."

"Don't try to kid me, professor. I know that Ray can read. I can prove it."

"And supposing he has learned a few words," he had parried. "Can you be sure I taught him? And if so, what had you thought of doing about it? Are you going to expose me as a corrupter of youth?"

"Not unless I have to," she had replied coolly. "I'm going to blackmail you, professor. I want you to teach me to read, too."

Now, with this gang of her father's Illiterate store officials present, a quick handclasp and a glance were all

they could exchange.

"How is he, Claire?" he asked.

"Out of danger, for the present. There was a medic here, who left just before you arrived. He brought nitro-caine bulbs, and gave father something to make him sleep. He's lying down, back in his rest room." She led him to a door at the rear of the office and motioned him to enter, following him. "He's going to sleep for a couple of hours, yet."

The room was a sort of bedroom and dressing room, with a miniscule toilet and shower beyond. Pelton was lying on his back, sleeping; his face was pale, but he was breathing easily and regularly. Two of the store policemen, a sergeant and a patrolman, were playing cards on the little table, and the patrolman had a burp gun within reach.

"All right, sergeant," Claire said. "You and Gorman go out to the office. Call me if anything comes up that needs my attention, in the next few minutes."

The sergeant started to protest. Claire cut him off.

"There's no danger here. This Literate can be trusted; he's a friend of Mr. Cardon's. Works at the brewery. It's all right."

The two rose and went out, leaving the door barely ajar. Prestonby and Claire, like a pair of marionettes on the same set of strings, cast a quick glance at the door and then were in

each other's arms. Chester Pelton slept placidly as they kissed and whispered endearments.

It was Claire who terminated the embrace, looking apprehensively at her slumbering father.

"Ralph, what's it all about?" she asked. "I didn't even know that you and Frank Cardon knew each other, let alone that he had any idea about us."

Prestonby thought furiously, trying to find a safe path through the tangle of Claire Pelton's conflicting loyalties, trying to find a path between his own loyalties and his love for her, wondering how much it would be safe to tell her.

"And Cardon's gone completely cloak-and-dagger-happy," she continued. "He's talking about plots against my father's life, and against me, and—"

"A lot of things are going on under cloaks, around here," he told her. "And under Literate smocks, and under other kinds of costume. And a lot of daggers are out, too. You didn't know Frank Cardon was a Literate, did you?"

Her eyes widened. "I thought I was Literate enough to spot Literacy in anybody else," she said. "No, I never even suspected—"

Somebody rapped on the door. "Miss Pelton," the sergeant's voice called. "Visiphone call from Literates' Hall."

Prestonby smiled. "I'll take it, if

you don't mind," he said. "I'm acting-chief-Literate here, now, I suppose."

She followed him as he went out into Pelton's office. When he snapped on the screen, a young man in a white smock, with the Fraternities Executive Section badge, looked out of it. He gave a slight start when he saw Prestonby.

"Literate First Class Ralph N. Prestonby, acting voluntarily for Pelton's Purchasers' Paradise during emergency," he said.

"Literate First Class Armandez, Executive Section," the man in the screen replied. "This call is in connection with the recent attack of Chester Pelton upon Literate First Class Bayne."

"Continue, understanding that we admit nothing," Prestonby told him.

"An extemporary session of the Council has found Pelton guilty of assaulting Literate Bayne, and has fined him ten million dollars," Armandez announced.

"We enter protest," Prestonby replied automatically.

"Wait a moment, Literate. The Council has also awarded Pelton's Purchasers' Paradise damages to the extent of ten million dollars, for losses incurred by suspension of Literate service, and voted censure against Literate Bayne for ordering said suspension without consent of the Council. Furthermore, a new crew of Literates, with their novices, guards, et cetera, is being sent at once to your

store. Obviously, neither the Fraternities, nor Pelton's, nor the public, would be benefitted by returning Literate Bayne or any of his crew; he has been given another assignment."

"Thank you. And when can we expect this new crew of Literates?" Prestonby asked.

The man in the screen consulted his watch. "Probably inside of an hour. We've had to do some re-shuffling; you know how these things are handled. And if you'll pardon me, Literate; just what are you doing at Pelton's? I understood that you were principal of Mineola High School."

"That's a good question." Prestonby hastily assessed the circumstances and their implications. "I'd suggest that you ask it of my superior, Literate Lancedale, however."

The Literate in the screen blinked; that was the equivalent, for him, of anybody else's jaw dropping to his midriff.

"Well! A pleasure, Literate. Good day."

"Miss Pelton!" The man in the blue-and-orange suit was still trying to catch her attention. "Where are we going to put that stuff? Russ Latterman's out in the store, somewhere, and I can't get in touch with him."

"What did you say it was?" she replied.

"Fireworks, for the Peace Day trade. We want to get it on sale about

the middle of the month."

"This was a fine time to deliver them. Peace Day isn't till the Tenth of December. Put them down in the fireproof vault."

"That place is full of photographic film, and sporting ammunition, and other merchandise; stuff we'll have to draw out to replace stock on the shelves during the sale," the Illiterate objected.

"The weather forecast for the next couple of days is fair," Prestonby reminded her. "Why not just pile the stuff on the top stage, beyond the control tower, and put up warning signs?"

The man—Hutschnecker, Prestonby remembered hearing Claire call him—nodded.

"That might be all right. We could cover the cases with tarpaulins."

A buzzer drew one of the Illiterates to a handphone. He listened for a moment, and turned.

"Hey, there's a Mrs. H. Armytage Zydanowycz down in Furs; she wants to buy one of those mutated-mink coats, and she's only got half a million bucks with her. How's her credit?"

Claire handed Prestonby a black-bound book. "Confidential credit-rating guide; look her up for us," she said.

Another buzzer rasped, before Prestonby could find the entry on Zydanowycz, H. Armytage; the Illiterate office worker, laying down one phone,

grabbed up another.

"They're all outta small money in Notions; every son and his brother's been in there in the last hour to buy a pair of dollar shoestrings with a grand-note."

"I'll take care of that," Hutsch-necker said. "Wait till I call control tower, and tell them about the fire-works."

"How much does Mrs. H. Armytage Zydanowycz want credit for?" Prestonby asked. "The book says her husband's good for up to fifteen million, or fifty million in thirty days."

"Those coats are only five million," Claire said. "Let her have it; be sure to get her thumbprint, though, and send it up here for comparison."

"Oh, Claire; do you know how we're going to handle this new Literate crew, when they get here?"

"Yes, here's the TO for Literate service." She tossed a big chart across the desk to him. "I made a few notes on it; you can give it to whoever is in charge."

It went on, like that, for the next hour. When the new Literate crew arrived, Prestonby was delighted to find a friend, and a fellow-follower of Lancedale, in charge. Considering that Retail Merchandising was Wilton Joyner's section, that was a good omen. Lancedale must have succeeded to an extraordinary degree in imposing his will on the Grand Council. Prestonby found, however, that he would

need some time to brief the new chief Literate on the operational details at the store. He was unwilling to bring Claire too prominently into the conference, although he realized that it would be a matter of half an hour, at the outside, before every one of the new Literate crew would have heard about her Literate ability. If she'd only played dumb, after opening that safe—

Finally, by 1300, the new Literates had taken over, and the sale was running smoothly again. Latterman was somewhere out in the store, helping them; Claire had lunch for herself and Prestonby sent up from the restaurant, and for a while they ate in silence, broken by occasional spatters of small-talk. Then she returned to the question she had raised and he had not yet answered.

"You say Frank Cardon's a Literate?" she asked. "Then what's he doing managing the Senator's campaign? Fifth-columning?"

He shook his head. "You think the Fraternities are a solid, monolithic, organization; everybody agreed on aims and means, and working together in harmony? That's how it's supposed to look, from the outside. On the inside, though, there's a bitter struggle going on between two factions, over policy and for control. One faction wants to maintain the *status quo*—a handful of Literates doing the reading and writing for an Illiterate public, and holding a monopoly on

Literacy. They're headed by two men, Wilton Joyner and Harvey Graves. Bayne was one of that faction."

He paused, thinking quickly. If Lancedale had gotten the upper hand, there was likely to be a revision of the Joyner-Graves attitude toward Pelton. In that case, the less he said to incriminate Russell Latterman, the better. Let Bayne be the villain, for a while, he decided.

"Bayne," he continued, "is one of a small minority of fanatics who make a religion of Literacy. I believe he disposed of your father's medicine, and then deliberately goaded him into a rage to bring on a heart attack. That doesn't represent Joyner-Graves policy; it was just something he did on his own. He's probably been disciplined for it, by now. But the Joyner-Graves faction are working for your father's defeat and the re-election of Grant Hamilton.

"The other faction is headed by a man you've probably never heard of, William R. Lancedale. I'm of his faction, and so is Frank Cardon. We want to see your father elected, because the socialization of Literacy would eventually put the Literates in complete control of the government. We also want to see Literacy become widespread, eventually universal, just as it was before World War IV."

"But wouldn't that mean the end of the Fraternities?" Claire asked.

"That's what Joyner and Graves say. We don't believe so. And suppose

it did? Lancedale says, if we're so incompetent that we have to keep the rest of the world in ignorance to earn a living, the world's better off without us. He says that every oligarchy carries in it the seeds of its own destruction; that if we can't evolve with the rest of the world, we're doomed in any case. That's why we want to elect your father. If he can get his socialized Literacy program adopted, we'll be in a position to load the public with so many controls and restrictions and formalities that even the most bigoted Illiterate will want to learn to read. Lancedale says, a private monopoly like ours is bad, but a government monopoly is intolerable, and the only way the public can get rid of it would be by becoming Literates, themselves."

She glanced toward the door of Pelton's private rest room.

"Poor Senator!" she said softly. "He hates Literacy so, and his own children are Literates, and his program against Literacy is being twisted against itself!"

"But you agree that we're right and he's wrong?" Prestonby asked. "You must, or you'd never have come to me to learn to read."

"He's such a good father. I'd hate to see him hurt," she said. "But, Ralph, you're my man. Anything you're for, I'm for, and anything you're against, I'm against."

He caught her hand, across the table, forgetful of the others in the office.

"Claire, now that everybody knows—" he began.

"Top emergency! Top emergency!" a voice brayed out of the alarm box on the wall. *"Serious disorder in Department Thirty-two! Serious disorder in Department Thirty-two!"*

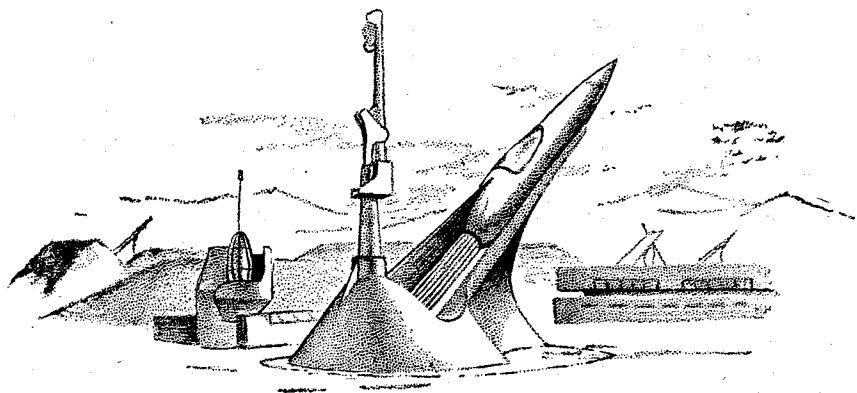
The voice broke off as suddenly as it had begun, but the box was not silent. From it came a medley of shouts, curses, feminine screams and splintering crashes. Prestonby and Claire were on their feet.

"You have wall screens?" he asked. "How do they work? Like the ones at school?"

Claire twisted a knob until the number 32 appeared on a dial, and pressed a button. On the screen, the Chinaware Department on the third floor came to life in full sound and color. The pickup must have been

across an aisle from the box from whence the alarm had come; they could see one of Pelton's Illiterate clerks lying unconscious under it, and the handphone dangling at the end of its cord. The aisles were full of jostling, screaming women, trampling one another and fighting frantically to get out, and, among them, groups of three or four men were gathered back to back. One such group had caught a store policeman; three were holding him while a fourth smashed vases over his head, grabbing them from a nearby counter. A pink dinner plate came skimming up from the crowd, narrowly missing the wired TV pickup. A moment later, a blue-and-white sugar bowl, thrown with better aim, came curving at them in the screen. It scored a hit, and brought darkness, though the bedlam of sound continued.

TO BE CONCLUDED



THE COG

BY CHARLES E. FRITCH

A neat little piece about the man who didn't make it; he had to stay behind when the first ship left for space . . .

Illustrated by van Dongen.

The crowds had come early and stayed long, bringing their families as though on a picnic. They sat close to each other on the massive lawn where they ate packed sandwiches of ham and jelly and drank warm soft drinks and cool coffee. And they waited, droning like a great hive. The sun glinted from the shiny silver metal of the spaceship *President*, which towered above them like a silver monument and cast a giant needle's shadow that shrunk into itself as the morning grew old.

James Maxwell sat and listened to the quiet drone of bee-voices murmuring through the morning stillness, and he knew what had brought many of them here—curiosity, for some; mere awe of the unusual, for others. But the rest, especially the younger ones,

the ones straining star-filled eyes to see—he well knew the feeling they felt, the utter, indescribable exhilaration, the longing.

Longing? He wondered if anyone had ever known a longing as he had, and in the same thought knew with a selfish bitterness that they had; he felt a knot of remembrance tighten in his throat, and he wondered how many of those youngsters would satisfy that urge, and how many, many more would fail their desires, as he had failed, and take up respectable jobs in the community to become standard cogs in the machinery of society.

And yet they needed cogs, or the machinery would not run. Suppose everyone were a spaceman, then what? The world needed doctors and law-

yers and even government officials. Everyone, from the President down to the lowliest laborer, was a cog. The spacemen, themselves, were cogs. He felt secure in the thought that it was more than a rationalization.

And then, suddenly, he wasn't sure, and he stared into the bright sky and wondered, as he often did, what it might have been had he followed Gerard Adams twenty years ago.

Gerard had felt that same longing, that beckoning of the stars. He had known that desire that came inexorably on the wings of night when stars blink their welcome through the cool blackness. Gerard, too, had stopped and stared into the velvet sky—and had seen his destiny there.

Gerard Adams had been the first man to land on the Moon.

He had died, of course—in space where he should have died, for that was his destiny and he would not have had it otherwise. He had tried for Mars and failed, and his rocket had disintegrated into fragments too small to be recognized.

James Maxwell wondered how *he* would die. In bed, probably, an old man hardly capable of reaching the medicine on the table beside him—much less the stars!

It seemed at times a cruel joke that fate had prepared for him, but there it was and what could he do? The answer was the same as it had always been: Nothing. Maybe tomorrow, he'd said; prepare for law so you can

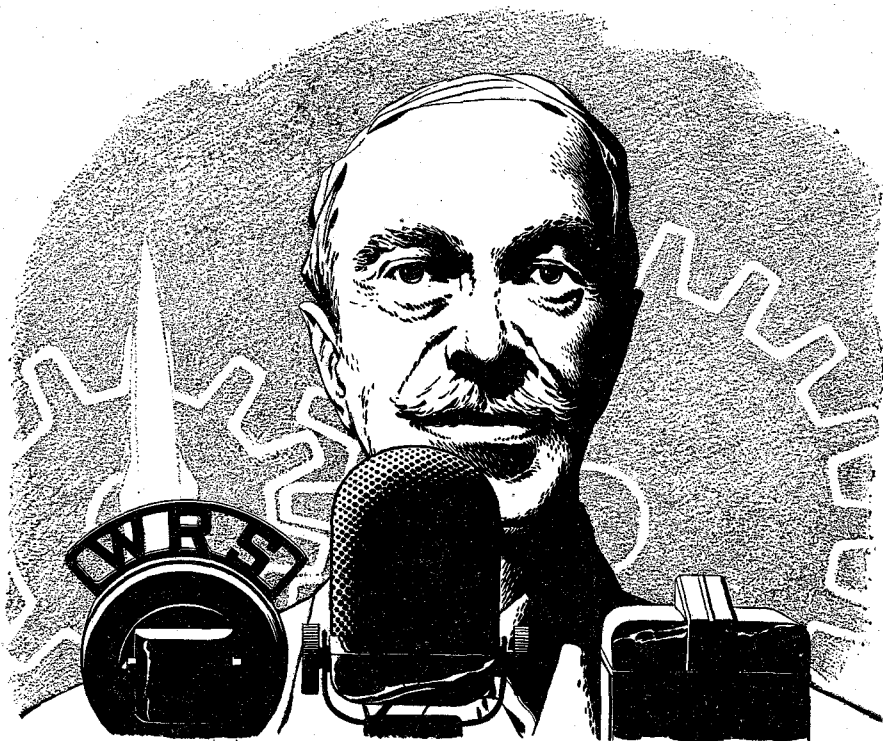
make a living while getting ready to go into space with Gerard and the others. That and the pressure of relatives. He used to feel cheated and clench his fists in savage denial of his destiny. But now he stood quietly by, staring at the sky, with no rationalizations to offer. Not one.

A speaker rose and the crowd hushed expectantly, waiting to hear magic words from the many amplifiers surrounding them. The man spoke, but James Maxwell did not listen. The voice boomed out over the sun-swept listening crowd, and the tall spaceship watched the sun go down the sky and it stretched an impatient shadow-finger across the people who came to pay it homage. The man spoke of the glories of the conquest of space, the glorious infancy of space travel.

Space travel was indeed young, James Maxwell knew, a mere twenty years, enough to mature a fast-growing science—and enough to age a man. The thought was sheer torture, and he fought to subdue it.

This was hardly the way to put the thought from his mind, though. Not by being here beside this enormous needle pointing the direction to heaven. Not by feeling its enormity so close and personal, towering significantly over the cogs that had made its existence possible.

James Maxwell let his gaze wander up, up, up along the smooth metallic contours, beyond the hundreds of



tons of steel and quartz and wire and plutonium to the blueness that stretched to infinity. In an hour the rocket would be out there, among that blueness. In less than an hour, the crowds would be cleared away and watching with rapid hearts at a safe distance, as the rocket belched orange flame and rose into the sky on a tower of fire.

If only he were aboard.

The thought was there, frank and unashamed. If only he could desert

the life he now had, exchange it for that of the lowliest crewman aboard. If only—

He almost laughed aloud at the thought. It was too late; years too late. Other men would go aboard the *President*. Younger men trained for just such a purpose. Training also fit certain cogs in certain places. He had studied law—the machinery had shifted, making room. It was that simple.

The young spacemen stood on the

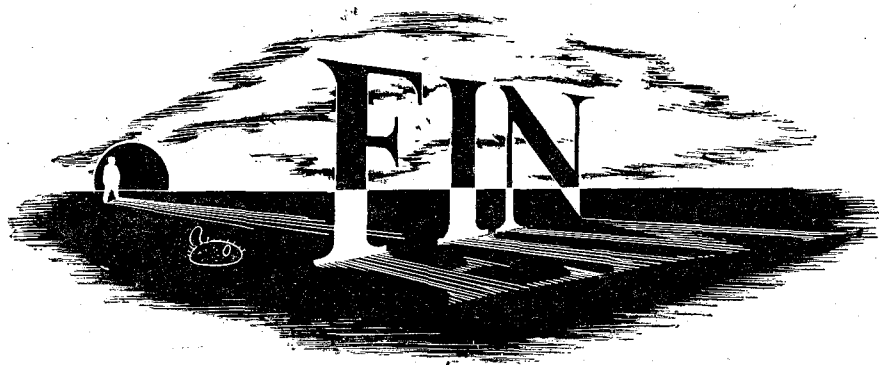
speakers' stand, shifting nervously, pride on their clean-scrubbed faces, smiling, proud of their roles and yet humble with all of space looking down at them. James Maxwell looked carefully into the face of each one, reading the thoughts there—his own thoughts, unrealized. He was envious, of course, but he was not bitter, and he was glad that he was not bitter. This was the way it had to be.

The First Lady rose and walked, amid a great cheering, to christen the spaceship. Her champagne bottle smashed across the tail fin, splashing frothing liquid, and a huge cheer welled and broke among the crowd. They laughed and whistled and clapped and cheered, and the warm afternoon air carried the glad sounds aloft where they seemed to linger even when the cheers had subsided.

James Maxwell felt a part of that enthusiasm. He felt his blood rushing through his body as though it were on fire, and his heart pounded a glad excitement. These people, many of them wanted to go, but they would have to go by proxy—and they were satisfied. And suddenly he realized that he, too, would be satisfied; he would be represented even more than the others. It would be as though he, personally, were soaring through the depths of space on wings of fire!

A man's voice was crying over the loud-speaker: "Ladies and gentlemen. The President of the World Republic!"

The voice echoed from the spaceship and rose over the crowd and into space, and, amid the new ovation, James Maxwell cleared his throat and stepped forward.





SAFETY VALVE

BY RICHARD DEMILLE

He had a letter to deliver . . . but the local customs made delivering a letter at that particular time something more on the order of an ordeal than a task!

The bearings of the carron hummed.

Remble was reading his instructions for the last time. He wished his employer could have taken a little longer to explain the operation. As it was, he was guided mainly by principles of strategy—which was all right, except that the tactics were almost wholly missing. Almost. He touched the envelope in his pocket.

" . . . It is felt," the instructions were saying, "that the opposition will become alert to any stray element which is introduced into the scene and that they will pick up such an element and use it—like the opportunists they are. If this element is not stray or chance, from our point of view, we may turn out to be even better opportunists.

"Proceed with confidence. Make your approach as simple and unsuspectable as possible. Take your cue from the circumstances you meet. The opposition is determined and clever, but is not above being deceived. The very fact that you have no rigid plan to carry out is in your favor. They cannot trap you in an act if your only actions are geared to their own, but your presence may cause them to reveal their own plan and to change it. Our object is to make them show their hand and, at the same time, to check our source of information.

"Remember, there is some danger. Protect yourself. But do not carry a weapon if you can help it. I will be alert to your situation."

The familiar fields of Tandilend flashed by the windows, and the border of Verdurilend was announced on the loud-speaker. Remble tore the paper into small pieces and dropped them through a slot in the arm of his chair.

It was late in the afternoon when he arrived at Ohndive, the chief city of Verdurilend. Chimnéys were smoking, against the blue-black cloud banks, and the taste of recent rain was heavy in the air.

Remble took a car to the main post office and entered it just as the door was being closed for the night. An harassed clerk looked up as Remble approached the counter and stared, as if by staring he could cause Remble to vanish. Finally he admitted Remble's presence and asked querulously what was wanted.

"I have a letter for the Mayor of Ohndive." Remble flourished the fat envelope, which exuded an air of importance from its seals and markings. "An urgent letter which must be delivered at the earliest possible time."

The clerk smiled a smug and unpleasant smile. "The earliest possible time would be three days from now. Just drop your letter in the box, and it will be taken care of."

Remble objected. "This letter is not to be delayed. It is for the Mayor of Ohndive. It must be delivered right away."

The clerk sat back upon his stool

and began to enjoy the encounter. "Are you perhaps a stranger in this country? I notice that you speak strangely."

Remble admitted that he was a stranger and repeated that his letter must be delivered.

The clerk spoke with mock solicitude. "Since you are a stranger, perhaps you do not know that tomorrow is the first of the Lawless Days. During the Lawless Days, all activities of the post office are suspended, and the personnel of the department retire to their homes, as do all honest citizens with the exception of the volunteers for the protection brigade. For the next three days, there will be no one in this office except two men who will be guarding it against vandalism and robbery. Under their guard, your letter will be quite safe here. In fact, this is one of the few places where it will be safe. Therefore, I advise you to leave it with me now," the clerk held out his hand for the letter, "so that it can be delivered in due time, after three days." When Remble did not offer the letter, the clerk continued sharply, "This office is already closed, and I can't stay here discussing this with you all night. I want to get home and secure my doors and windows—and if you know what is good for you, you will find some place to stay, and do the same."

"I cannot give you the letter," said Remble. "I was told to deliver it in person and not to let it out of my sight

until it was in the possession of the mayor himself."

The clerk sniffed. "If you care for the safety of your letter, you will leave it here under guard. But I see that you do not fully understand the situation. On the Lawless Days, no ordinary citizen can feel safe unless he has taken strong measures to protect himself. You, as a stranger, are more vulnerable than most. If the letter contains anything of value, and even if it does not, you are almost certain to lose it during the next three days. You are even more certain to lose your money. And if all you lose is the letter and the money, you will be luckier than you deserve to be." He held out his hand for the letter again. "Come on, give it to me, or get out."

Remble clutched the letter. "I will neither give it to you nor get out. I require only to be told how to get to the mayor. I will deliver the letter myself, this evening. Just tell me how to get to the mayor, and don't worry about me any further."

The clerk laughed loudly. Another clerk came over, and the first clerk explained Remble's request to him. The second clerk began to snigger. "Wants to go to the mayor, eh?" He slapped his thigh and was convulsed with glee. "Just like that! Wants to go to the mayor."

Remble's face got red, and he glowered at the two clerks. When they had quieted a little, he said, "I demand

to be taken to your superior. I have a very important letter for the Mayor of Ohndive, which must be delivered as soon as possible. If you two are not in a position of great enough responsibility to be able to understand this, then take me to someone who is."

The two clerks were brought up short. They looked at each other, and a conspiratorial expression spread across their faces. The first turned to Remble. "I will see whether the station master is still here. I will tell him about your case." He walked to the back of the office and went through a door. The second clerk put on his coat and hat. As he went out, he wished Remble good luck, and laughed sarcastically.

Remble waited for several minutes. The clock whispered upon the wall. The time was already seventeen-fifteen. He thought he heard laughter in the back room, and then a sound as though of someone talking to another whose answer was not heard—a monotonous tone, with long pauses.

At seventeen-twenty-five, a fat man came out of the back room, followed by the first clerk. The fat man went to the front door, without looking at Remble for more than a second, said good night to the clerk and went out. The first clerk put on his coat and hat. Remble rose and went over to him. Before he could speak, the clerk turned. "The station master says that

you must either leave the letter with us now or take your chances during the Lawless Days."

"What about the mayor?" said Remble, anger trembling in his voice.

"What about the mayor?" said the clerk, as though the subject had just come up for the first time.

"I want directions for getting to the mayor, so that I can deliver this letter—which is what must happen in any case, whether tonight or three days from now."

The clerk humphed. He locked the gate of the counter. "That is completely out of the question. If you want to deliver the letter in person, you must wait until after the Lawless Days. The mayor will not be receiving now. When the Lawless Days are over, you may then deliver your precious letter—if you still have it, and if you are still able to deliver anything to anybody." He pushed his way out the door.

Remble ran after him. "Wait!" he shouted down the steps, but the clerk hurried away. Two men with F-guns came up the steps, pushed Remble aside and entered the post office. Remble went in after them and began to speak. Before he could say more than two words, the men seized him by the lapels of his coat and dragged him outside.

"Sorry, friend!" said one of them. "We can't have any loitering during the Lawless Days. If you have any business here, come back in three

days. And not a minute sooner."

Remble tried to tell the man about the letter, but the other man drew his F-gun and pointed it directly at Remble's face. "Did you ever see what one of these does to a human head?" His tone was as though he had said, "Did you ever look closely at one of these old jade mirrors?" but Remble could tell that he was ready to use the gun. He shook his head. "Well," said the man, wagging the gun, "you can see it a lot better if it isn't happening to you at the time. Be on your way, and keep your eyes open. You may have a chance to find out all about it."

Remble put the letter in his pocket and went down the steps.

It was not hard to get a room. The Hotel Rabikohl was able to offer Remble whatever accommodations he desired. The manageress explained that all the foreigners who had been staying there had left town that day or on preceding days. Then she hastened to add, "But do not worry, Messer Remble. There is no place safer than the Rabikohl. It is just not safe to go out. Within the hotel," she waved her hand proudly about the ancient room, "we shall be snug and well protected. The protection brigade has promised to keep four men patrolling this block at all times." She winked at him. "I had to assure them, in return, that this would be a good place for them to be just a little lawless, on their off hours. They are

nice boys—they know how to get along." The manageress smoothed the sides of her satin dress with many-ringed hands and smiled at Remble in a motherly way. "And just why did you come to us, Messer Remble?"

Remble could see where the conversation was leading. "I am in Ohndive on business," he said. "Unfortunately, I had to come at this time, and thus far I have been prevented from carrying out my business—which is with the mayor. Perhaps I shall be able to carry it out this evening or, with luck, sometime tomorrow."

The manageress' face had fallen at Remble's recital of his reason for coming to Ohndive. Now, at his mention of business on the morrow, her look of disappointment was replaced by one of horror. "Oh! You wouldn't think of going about the city—" Her mouth remained open, but no further words issued from it.

"What time do the Lawless Days begin officially?"

The manageress came to herself, reluctantly. "Well, officially, they begin tonight at midnight, and anyone who acts outside the law before midnight runs a considerable risk of being caught and charged. But unofficially they begin at dark—which is right now." The manageress peered through the small, grated opening in the window shields at the front of the hotel. "And I wouldn't dream of trying to walk or ride through the streets before the lawless period is ended." Her face

brightened. "There is plenty of food here at the hotel, though, Messer Remble. Plenty of food, and, if I may say so, adequate company for a gentleman, like yourself." She saw that Remble was growing impatient. "At any rate, you will find whatever you want right here in the hotel—except business. I would strongly advise you to put aside all thought of business until afterwards."

Remble selected a modest room on the second floor. His traveling bag was carried up by a bent and seamed porter, who thanked him gratefully for a generous tip.

The door of the room had an intricate arrangement of bolts, and when Remble had mastered its operation, he felt that it would be quite secure against intrusion, should any of the protection brigade grow too enthusiastic in their "little lawlessness."

The attitude of the two armed men at the post office and the evident agitation of the manageress made Remble consider his situation in a stronger light. The going might be more sticky than his employer had suggested. Nevertheless, if he entered into the spirit of the occasion, he should be able to make contact with the opposition without suffering any damage. The Lawless Days could not be so terrible, or they would not be an established custom. The very existence of the protection brigade showed that the activities of the law-

less were to be kept within some bounds. Undoubtedly, many persons were preparing to enjoy the next three days. Why should he not be one of them? He wished, however, that his instructions did not preclude carrying a weapon. An F-gun under his coat would have been comforting.

Remble took a bath and went down to dinner. He carried the letter with him. During dinner, he had conversation with an old man. They spoke about the Lawless Days.

"It's a time, all right!" The old man chewed a piece of meat with difficulty and washed it down with great gulps of red wine. "There's lots of talk about repealing, but I don't think they'll ever get around to that. People are too fond of the peace and quiet all the rest of the year, and they like the low taxes. Just think what it would cost to keep up the protection brigade all the year round. Why, it would hardly pay a man to work, taxes would be so high. Of course lots of people get robbed and windows get broken and a few buildings get burned down—but we're ready for 'em. If all of that was spread out during the rest of the year—unexpected—why, I'll wager you couldn't save half of the buildings, or protect a tenth of the people."

"Isn't there some kind of a movement for repeal?" Remble cast an eye about the dining room.

"Oh, yes. Like I said." The old man filled his glass again. "Every year

there's a campaign of some kind. During election years, things get hot. But they always seem to vote for the man who favors the old customs. Must be something in 'em. Mayor Bone, he favors the old customs. Got elected on that just last year. Of course, most people don't take part in the *festivities*—the old man winked and laughed silently—"but they feel a lot safer the rest of the year, knowing the rough ones and the sly ones got most of it out of their system during the period." The old man tilted his head back and stared into the distance. "I remember when I was a young fella—we used to have some times, all right. Makes it a lot easier to abide by the law, when you know there're days coming when you can tear it up a little. Not supposed to plan anything ahead of time, you know"—the old man winked again—"but it's pretty hard to prove premeditation on a fella that's careful about how he does it and what he uses."

Remble's examination of the other diners was revealing no one who looked more likely for his purposes than this talkative old man. He seized upon a pause in the steady stream of reminiscences, to ask, "Do you know where the mayor lives?"

The old man looked surprised. "Why, sure. Everybody knows where the mayor lives. Why?"

Remble hesitated a moment. Then he said, "I have a letter to deliver to

the mayor, and I thought if I could find out where he lives tonight, I could deliver it before the Lawless Days begin in earnest."

The old man's eyes twinkled. "Going to deliver a letter, eh? Well, I wouldn't be one to discourage a young man like you from looking for adventure. I can tell you how to get to the mayor's house, but I can't guarantee the mayor will be in it. These high and mighty ones have some pretty careful habits when it comes to the Lawless Days. You know, a young letter carrier like yourself could just slip in there and raise the devil with the mayor, and not get anything more for it, maybe, than locked up for a couple of days—if he didn't have any signs of premeditation on him." The old man's grin was nearly toothless. "Or, if he was for repeal, he could just get us a new mayor, by succession—"

Remble protested. "Why would anyone want to do that?"

The old man spoke with mock seriousness. "Well, I've heard tell there're a few people around would like to do away with the Lawless Days, and would like to start by doing away with the mayor. Of course, *you* wouldn't know anything about *that*."

Remble interrupted. "But why would such people want to do away with the Lawless Days? If they like violence, I should think they'd want to keep the Lawless Days."

The old man's eyes slitted in cynical



Remble nodded. "I see."

"I'll just bet you do." The old man lifted his glass.

Remble was suddenly bored. Time was getting short. It was already a little after twenty. He took pencil and paper out of his pocket and prepared to write down the address of the mayor, as the old man should give it to him.

wisdom. "If you were one of those people," he said craftily, "would you want to have just three days a year for being lawless, or would you rather be able to choose any day you wanted, any time of the year?"

The old man looked at him in wonder. "If I was doing as good as you are at not showing signs of premeditation, I wouldn't spoil everything by writing down notes before midnight tonight. Those boys in the protection

brigade are no fools. They find that on you, you'd be lucky to get a trial—in fact, going after the mayor, you'd be lucky even to get questioned for premeditation."

Remble answered impatiently. "I'm not going after the mayor. I just have a letter to deliver to him."

The old man frowned. "If that's the truth, I'll have to change my mind about you. I didn't have you figured for such a . . . well—" The old man shook his head in disgust. He began to dictate directions to Remble. Not until Remble paid for both their dinners did the old man resume his former affability.

The bill came to eight ibilo, which was reasonable.

There were still cars for hire on the streets. The rates had gone up ten to fifteen times, due to the occasion, but most people who found themselves away from home after dark were glad to pay the price.

Remble told his driver the address, without mentioning the mayor. The car sped along the emptying streets for several minutes. Then the driver spoke suddenly. He was a burly man, and his voice was gruff. "You wouldn't be goin' to pay a visit to the mayor, would you?"

Remble cleared his throat. "As a matter of fact, I have a letter—a very important letter—which must be delivered tonight to the mayor, and they told me at the post office—"

The driver pulled up to the curb and stopped abruptly. "That'll be thirty ibilo. I can't take you any farther. I'm not going to get in for any premeditation!" He got out of the car and opened the hatch for Remble. His look was menacing. Remble opened his mouth to protest, but thought better of it. He rose from the car and paid the driver thirty ibilo. The driver counted the money, entered the car and drove away without saying a word.

Remble looked around him. A sign gave the name of the street as "Yels-rap Farwey." His directions did not include such a street. He stood looking up and down the street for several minutes, wondering if anyone would approach him. A hire car went by, and he hailed it, but it did not stop. He was not in a very likely place to be picked up. The street was poorly lit. The fronts of the buildings were boarded up. There was no one in sight.

Remble began to walk. He watched the names of the streets as he passed them, but none of them meant anything to him. He began to re-evaluate his destination. If he met someone, should he be trying to reach the mayor's house? Or should he be trying to find the hotel, in order to wait for daylight? He decided that the hotel was the better choice. After all, he could not know whether or not he had yet alerted the opposition, though the sequence of events in the post office had strongly suggested it. Probably

he should go to the post office again tomorrow and make further inquiries.

As he was trying to retrace the route he had come from the hotel, a sound caught his attention. He stopped and turned. A private car was careening along the street. It pulled up sharply at the corner near him and stopped. It was tilted oddly to one side. He thought one of the tires must be flat.

The car sat for a moment, inert. Then someone got out of it, on the side away from him. He thought he saw long hair. The street was quiet, and the scrunch of shoes upon the gritty surface came clearly to his ears. Presently, a strange sound came to him, which made his hackles rise, until he realized that it was a woman sobbing.

He approached the car cautiously. When he was nearer, he could see her through the glass, standing on the other side of the car. Her face was in her hands.

Remble rounded the car and came up to her. She screamed and tried frantically to re-enter the car, but her fright prevented her. All she could do was fumble with the latch. She stared at him in horror.

Remble could see that she would be pretty, and more than pretty, if she were not in such a state. She was tall. Her hair was long and dark. Certainly, she was not yet thirty years old, and considering the harsh light of the street lamp, she might be much

younger. Her plain, straight-cut dress was that of a commercial clerk or secretary. It fitted well. Her ample body was delightfully proportioned.

Remble did not think that it would help to say anything, and so he stood trying to look as harmless as possible. The girl's breathing slowed. Her face assumed a look of alert anxiety. Remble smiled, and the girl appeared to relax.

"Forgive me!" Her voice was unsteady. "I thought you were . . . well, I—"

"Of course," said Remble. "What happened to your car?"

The girl nearly broke into tears again, at this question, but she managed to control herself. "Someone must have done something to the tire. I thought, when I saw you, that someone had done that . . . and then followed me—" She shuddered. "It would be a very easy thing to do." Remble nodded. She looked despairingly at the car. "I hate to leave it here, but there doesn't seem to be anything else to do."

"What about the protection brigade?"

"We could notify them," she said doubtfully, "but I don't think they would send a patrol just for a car, down here in this district. They have all they can do patrolling the streets where people live." She snuffled. "I never should have stayed out so late!"

Remble was about to suggest trying

to fix the tire, when a hire car entered the block and approached them.

"Oh, hail it, hail it!" the girl squealed.

Remble waved his arms at the car and shouted, with little hope that the car would stop. Then he was astonished to see it slow and turn toward them. For a moment he wondered if it were perhaps better if the car did not stop, but then he saw that it held only one man, the driver.

"Have a little trouble?" The driver leaned out of the car, over the front shield.

The girl did not answer, but began to climb into the car. The driver assisted her. Remble followed. The girl said, "Elak Hotel, please."

The driver spoke casually, taking his seat. "That's a long way from here."

The girl darted a glance through the window, at the menacing night outside. "I'll pay whatever the charge is." Her hand tightened upon Remble's arm.

"One hundred ibilo." The driver waited.

"All right!" The girl's voice was rising. "Just go on, go on!"

The driver was unaffected. "In advance," he said.

"See here!" Remble started to give the driver a piece of his mind.

The girl stopped him. "Never mind—" She fumbled with her case and brought out some of the bright

blue currency. Remble was quick to do the same. Each of them handed the driver fifty ibilo. He took them with a smile, and the wheels of the car spun upon the street.

Not until they were traveling sixty or seventy kilometers an hour did the girl sit back in her seat.

"Is the Hotel Rabikohl on your way, do you know?" Remble asked.

Her look was full of injury. "Is that where you want to go?"

Remble faltered. "Well . . . yes . . . that is—"

She looked into her lap, pouting. "It isn't on the way, really. But we could probably go by it, if we turn soon." She looked up at him. Her fearful eyes indicated the driver. Her dark face was close to his. He could feel her soft breath upon his lips. "I was hoping that you could come all the way with me to my hotel. It's getting so late." She put her hand on his. "I'm pretty shaky."

Remble's caution was suddenly lost in the depths of her pleading eyes. It was not illogical to think that he might be carrying out his mission by going with her. He could not yet be sure either way.

He patted her hand. "Well, of course! Of course, I'll go with you, if you wish."

The girl heaved a sigh of grateful relief. "My name is Roseen," she said.

Remble took her slender, brown hand and touched it to his lips. "Mine is Tavvle. I am a Tandinian."

"I thought you were." Roseen squeezed his hand.

"They're really terrible!"

Roseen handed Remble a tall goblet and sat down beside him on the two-chair. She had changed her dress for a flowing robe. All her nervousness was gone. Her long hair was combed out over the shining material. The freedom of her new costume made every movement a pleasure to watch. Remble allowed his thoughts to dwell upon such simple, tangible matters. He scarcely listened to her words.

"Every year we talk about doing away with them. Every year people are killed, property is destroyed, terrible things happen. And every year, nothing changes." She sipped her drink. "I was sure last year that the anti-lawless candidate would win—that was Councilman Steff. But he didn't. Old Bone got in instead!" She tossed her head. "Well, if something has to happen to somebody during the Lawless Days, I hope it happens to him. Maybe if he gets some of his own medicine, he won't have so much to say about how we can afford to have three Lawless Days a year in order to have all the others without crime."

Remble tasted his drink. It was good, and strong, too. A shadow of apprehension crossed his mind, but he dismissed it. Roseen seemed worth a gamble. "Is it actually true," he asked, "that the other days are with-

out crime—no arrests whatsoever?"

Roseen made a gesture of impatience. "Oh, I suppose they are, more or less. But with a permanent protection brigade, it could be that way all the time." She made a face. "I don't want to talk about that any more, Tavvle. I've had enough of it for today. Now that we are safe at home—and I hope you will consider this your home for the Lawless Days—we can afford to talk about other things." She pulled her feet up into the chair, turning towards him, so that she crouched as if to spring upon him. "Are you married, Tavvle?"

Remble set down his goblet. "No, though I have often thought about it."

Roseen sighed. "So have I!" She placed her goblet upon the table gracefully. "It must be nice to have a home and a family—someone to be with every night." She stretched her long arms and arched her back, looking sweetly down at Remble. "I would like that, I think."

"He's only asleep. Be careful!"

Remble awoke with a start. He had the distinct impression that he had just heard something he was not meant to hear. He lay still, listening tensely. Nothing happened. He whispered Roseen's name.

"Yes?"

"I thought I heard something."

Something went around his neck, and a frightful pressure crushed his

throat. He struggled, but his spent strength could not overcome the brutal force. The pressure in his head became unbearable.

"He's relaxing . . . don't kill him . . . loosen it. I've got the needle. You were supposed to dope him. I couldn't help it—"

Somewhere, in the dim mists of blackness, Remble felt the tiny sharp pain of the needle. *

It was late in the morning of the first of the Lawless Days when Remble regained consciousness. His immediate thought was that being alive exceeded his expectations. Then he seemed to remember knowing that he would be and thanking someone for sparing him.

He winced. Swallowing was painful. Turning his head was difficult, too. He tested his voice and found it husky but usable.

Rising from the rumpled bed, he found that he was otherwise unharmed. There was a sore place on his leg. Evidently, his assailants had held him only until he could be quieted by chemical means.

Stumbling about the room, he saw that nearly all signs of Roseen had vanished. Her clothes were gone from the closets—if, indeed, there had ever been any there. Nothing remained to prove her presence save a faint odor of perfume.

As Remble's head cleared, he remembered the letter. He looked for

his coat. It had been thrown in a corner. The lining was ripped, and the letter was missing. Remble smiled. The money was gone, too—which made him swear.

He went to the bathroom and let a stream of cold water run over him for a few minutes. He felt better. As he stood in the blower, he remembered Roseen vividly.

She had certainly placed his life in danger. His assailants could easily have choked him to death. On the other hand, he was still alive. He had suffered only a bruised throat, a torn coat, and loss of money and letter. It could have been worse. Much worse.

Remble sighed philosophically and began to dress.

As he put on his coat, which he had managed to repair with tape from the bathroom, he had an unpleasant thought. Without money he could not buy breakfast. Furthermore, the hotel might expect him to pay for the night's lodging—although Roseen and her accomplices had probably had to pay in advance for the room. He determined to make his exit unnoticed.

When Remble found himself again on the street, it was but lightly traveled. Occasional patrols of the protection brigade and even less frequent hire cars and private cars were the only traffic.

Remble stopped one of the patrols to ask his way to the nearest branch post office. The men looked at him

suspiciously, but gave him the directions. He began the trek. As he walked, he kept an eye out for anything untoward, and with the rest of his mind he began to think about Roseen.

The whole episode had had an air of planning about it which had far exceeded the value of the money he had been carrying or could have been suspected of carrying. They could hardly have been after anything but the letter. If that was so, then Roseen was working for the opposition, and the contact had been made. On the other hand, it might have been merely ordinary lawlessness.

The brief idea that Roseen might have been innocent in the affair occurred to him, but he knew that it was dictated by sweet memories. Her actions had been much too well timed. Remble even had the impression that he had heard her talking with his assailants, but he could not remember what might have been said. Still, he felt a pang of regret and wished that it might have been different. There were things about the lady which were vastly ill-suited to an opponent.

In the midst of his thoughts, Remble noticed a young man coming along the street towards him, watching him. As they passed, an arm shot out and grasped at his coat. Remble jumped back against the wall. The young man glanced up and down the street. Remble could see that he was drunk.

"Jus' gimme yer money, an' it'll be all smooth!" The young man smiled

heavily. "You won't get hurt."

"I haven't a cent," said Remble, wondering which way to jump if the young man should move again. He did not appear to be armed.

The untidy face clouded. "Gimme it, or you'll wish you did. Jus' gimme it—"

Remble had decided that he might fell the young man with an accurate kick, when a protection brigade patrol rounded the corner.

"What's going on here?" The patrolmen's hands rested on their guns.

The young man started, but regained his composure immediately. "I was jus' talkin' to this fella—"

A patrolman turned to Remble. "Did he get anything from you, Messer?" Remble shook his head. "On your way, then," the patrolman said to the young man, who lurched away down the street. "You better get inside somewhere, Messer. If you haven't anywhere to go, there's a brigade station two blocks over." The patrolman indicated a side street. Remble thanked him, but said he had somewhere to go.

In the next block, as he was passing a shuttered store, something crashed against the inside of the door, and a woman screamed. Remble did not even pause.

Presently, the post office came into view. It was a one-story building, of steel and concrete. The windows were of shelt. Remble went up the steps. The door was closed and locked. He

knocked. Nothing happened. He knocked louder. A voice said, "The post office is closed and under guard. What do you want?"

"I have a message for the mayor," Remble said, in a loud voice.

"Go away! We have orders to shoot."

"I am not armed. You may search me. I must reach the mayor." Remble tried to sound confident, but his empty stomach lent small conviction to his words.

There was silence within for a moment. Then the door was jerked open by an unseen hand. An F-gun appeared around it. "Get in here!" ordered the voice. Remble hurried through the door. "Lie down!" commanded another voice. Remble lay down. Someone searched him, then turned him over. Two husky men bent over him. One continued the search. Then he said, "You can get up now." He took Remble's hand and helped him to his feet. "Sorry about the formalities," he said, "but we don't want to build new post offices just because of the Lawless Days."

Remble said he understood perfectly.

"I notice you have no money," said the patrolman. "Did somebody take it?"

"Yes," said Remble, dusting his clothes, "and what is worse, they took a letter which I was carrying to the mayor—" Remble saw a glance pass between the men, but he continued without seeming to notice. "I tried to

secure the co-operation of the post office officials last night, so that I could be taken to the mayor and could give him the letter before the beginning of the lawless period, but I was unable to reach anyone of high enough authority. The men with whom I dealt were not of sufficient stature to see the necessity of quick and constructive action."

"Just a minute, friend," said the other patrolman suspiciously. "If you have lost the letter, why are you still trying to reach the mayor?"

Remble turned to him. "The letter was very important. I know something of its contents. I think the mayor should know as much as I can tell him, so that he can take whatever action he deems appropriate."

"And why have you come to the post office? Why not just go to the mayor and tell him about it?"

"I have already discovered that it is not so easy to reach the mayor during the Lawless Days—and since the post office is the only official organization in Ohndive of which I have any knowledge—and since it is close to the hotel where I spent the night—and since I was robbed of all my money and do not know my way about the city—"

"All right, all right, I believe you." The patrolman started across the room to where a machine stood against the wall. "Come with me, and we will send a message to the mayor and tell him all about it."

Remble hung back. "I can only tell the mayor that I want to see him. The rest of the message is confidential and must be told in private."

The other patrolman laughed. "Do you think the people who took the letter will keep it confidential?"

The first patrolman regarded Remble with a sour face, but Remble's helpless expression made him smile, at last. He turned to the machine, speaking over his shoulder as he operated it. "You may be in the right, but I don't think you're going to see the mayor."

When he was done, he said, "They may answer and they may not. Either way, it'll be a little while. You might as well sit down."

Remble took a seat on one of the benches, wondering just what message the patrolman had sent, and to whom. He still was not sure that he had made contact. A pleasant smell came to his nose. He looked around. The two men were taking parcels of food out of a box. Hunger twisted Remble's stomach, and he moved nearer to the men.

One of them looked at him. "You had lunch?"

"No, as a matter of fact—"

"Here." The man held out a meat roll.

Remble took the roll with thanks. Swallowing still caused him some distress. In a few moments he felt better.

After lunch, the three entered upon a discussion of Remble's misfortunes—as many of them as he thought

proper to disclose at this time.

"You might advertise on the duplicator, after the period is over," suggested one of the patrolmen.

"What do you mean?"

The patrolman loosened his belt and lit a cigar. "Well"—he puffed the flame—"some people who don't need the money go in for robbery just for the thrill. Afterwards, they might be willing to return it, especially if they knew the victim was a foreigner. Then, too, maybe they wanted the money but not the letter. You might offer a little reward for the letter and get it back. It's worth trying."

"Not much chance," said the other. "You'd have to offer a big reward, or they wouldn't bother."

"Well, a big reward, then."

"Still not much chance. The ones that act the wildest during the period are just the ones that don't like to admit it afterwards, even if nobody can prove premeditation on them."

"Yeah, that's right." The first patrolman had to agree. He contemplated the ash on his cigar sadly, and a silence fell upon the men.

Outside, in the street, someone shouted. "Brigade! Brigade! Help! Protection!" Remble expected the two men to spring up, but they did not move.

"Could be a trick," said one. "Our job is right here. Even if the building across the street burns down, we're not supposed to leave the post office."

The other strolled to the window and

looked out, through the transparent but impervious shelt. Returning, he said, "Just a man losing his clothes."

The bell on the communicator rang. The patrolman hastened to answer it. He read the message which ticked through and sent a reply. Another message came. He turned to Remble. "What is your name?"

"Remble. Tavvle Remble, from Schistone, Tandilend—with a message for the mayor!"

The patrolman smiled and sent again. The answer was immediate. Surprise filled the patrolman's face. He walked over to Remble, eying him carefully. "You will be taken to see the postmaster. A car will be here in a few minutes."

The other patrolman looked up in amazement.

The postmaster was a man of middle age but youthful appearance. He was good-looking, though a little heavy. His voice was deep, his manner pleasant.

"Now, Messer Remble, tell me about your situation."

Remble glanced briefly about the richly furnished private office of the postmaster. He noted the stained glass in the windows and the thick Zavrian carpet upon the floor, the heavy brass knobs. He felt the air of security, of well-guardedness, which flowed from the curtains and the heavy doors. Sitting upon a plush cushion supported by a heavy iron chair, he related the

whole of his experience since entering the city, sparing none of the details, with the exception of his private feelings about the treachery of Roseen. He explained his newness to the city, lamented his failure to gain the cooperation of the postal authorities before this, admitted his foolishness in mixing himself up with a supposed lady in distress while carrying the valued letter, and expressed hope that the postmaster would understand the necessity of his taking to the mayor the small information which he did still possess, in order that the matter might be set right as soon as possible. In closing, he threw himself upon the mercy and good judgment of the first person he had met who had sufficient rank and wisdom to deal with the troublesome problem at hand.

The postmaster appeared to be impressed. He sat a while in silence, fingertips together, lips pursed, brow furrowed. He emitted several contemplative grunts. At last he said, "Messer Remble, I am struck by the candor of your story and by your evident earnestness. Against the caution which I should otherwise observe in these perilous and primitive days, I will take you to the mayor, so that you may in some measure recover the ground which you have lost through ignorance of our unfortunate custom and through a certain lack of ordinary good sense." He smiled at the abashed Remble. "We Verdurians, and especially the citizens of Ohndive, do not like to turn a

stranger away, even though he may have brought his troubles upon himself. I shall take you to the mayor's place of retreat." He rose from his chair. "Since it is the mayor's place of retreat, just as this place is mine, I hope you will not mind resuming the blindfold which you wore when coming here."

Remble said he would not mind, but inwardly he felt a twinge of fear. He thanked the postmaster for understanding his problem so well, but the postmaster seemed hardly to hear him. An expression of determination made his face hard as granite. Remble wished he could read the thoughts behind that face, but soon even the sight of it was hidden by the blindfold.

When Remble could see again, he found himself standing in a small but elegant reception hall. A servant was just leaving the room to tell the master of the house that he had guests. The postmaster was standing by Remble's side. He looked nervous and did not speak to Remble.

Remble looked about the room, in admiration. The woman returned. The postmaster said he knew the way. They proceeded into the interior.

Rounding a corner, at the end of a long hall, they stopped. Before them, on an open terrace, were four people, having tea at an ornamental table. The postmaster spoke in Remble's ear. His voice shook. He stood behind Remble and fumbled with something.

Remble was distracted by the appearance of the gray-haired man at the table. "Those are the mayor's two daughters, Yffin and Pineffa," said the postmaster, keeping well behind Remble, as Remble tried to turn toward him a little. "The older lady is his wife. And of course, the gentleman is *Mayor Bone*."

As these words were said by the hard-breathing postmaster, Remble glimpsed the menacing sheen of an F-gun. It was pointed at the gray-haired man.

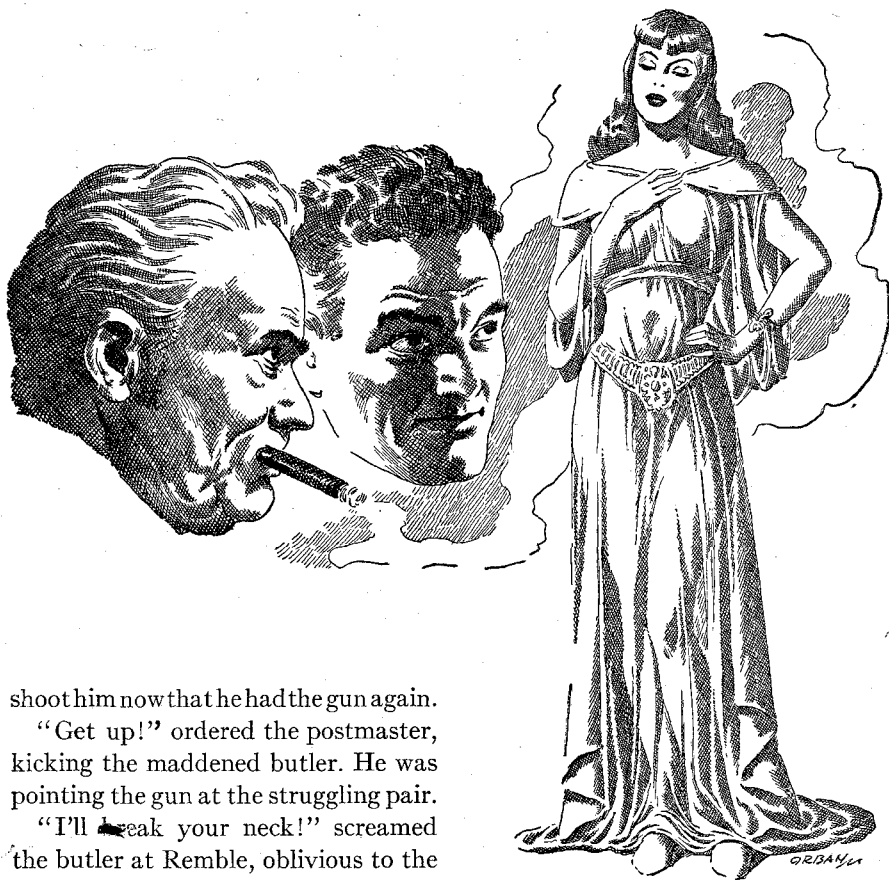
Before Remble could strike the arm that held it, the gun spat, and the victim's face seemed to melt.

The postmaster grappled with Remble and set up a terrible shouting for help, roaring at the top of his voice that the mayor was slain by a madman.

As he fought, Remble saw that the dead man had fallen forward into the teacups. The three women had risen as one, screaming.

He managed to break the hold of the postmaster upon the F-gun. It flew into the bushes and he dove after it. As he came up with the gun in his hand, he was hit hard by a burly butler, who had come running in response to the shouts and screaming.

Remble's hand struck the stones and the postmaster's foot crushed it. He gasped with pain. The butler was trying to choke him. His already tender throat had to be defended. He wondered if the postmaster would



shoot him now that he had the gun again.

"Get up!" ordered the postmaster, kicking the maddened butler. He was pointing the gun at the struggling pair.

"I'll ~~break~~ your neck!" screamed the butler at Remble, oblivious to the postmaster's presence.

"Stop that!" shouted the postmaster, pommeling the butler. Remble was almost grateful to him.

Amid the wails of the women and the fury of combat, the butler finally realized where his duty lay, and rose reluctantly from his task. He turned to the postmaster. "Just let me give it to him!"

The postmaster was already calm. "No, no. One killing is enough. We

must learn who his accomplices are." He held out the gun. "This is a coded weapon. He could not have it unless he had premeditated!"

The very word made the butler shrink from Remble, and the women, overhearing it, subdued their cries to a pitiful whimpering.

The postmaster's driver was called,

and Remble was marched away brusquely.

"To the prison!" the postmaster said savagely.

As the car raced through the city, Remble's mind returned again and again to the appearance of the murdered man. He was worried.

The trial was held on the second day after the Lawless Days.

The postmaster, who was now the new mayor—that being the order of succession—gave his testimony in a flood of self-recrimination and tears at his slackness in allowing a fiend and madman like Remble to deceive him into aiding this horrible and premeditated crime. He pointed a trembling finger at Remble and opened his mouth to accuse him, but was overcome with emotion, so that he had to be led from the courtroom.

The butler, rigid with rage, gave a clear and damaging account of his part in overcoming the murderer.

The maid testified that Remble had acted suspiciously upon entering.

The family of the mayor was excused from testifying, since they had suffered such a severe shock, and since the prosecution felt that the case against Remble was overwhelming, even without their testimony.

A man was produced by the prosecution, who had turned state's evidence, admitting that he had sold the coded F-gun to Remble on the day before the Lawless Days. This was ample

proof of premeditation, the prosecutor said. The exact time given by the man coincided with Remble's first hour with Roseen.

Though Remble knew that he had begun his adventure with a card which could trump all those that were being played by the postmaster and the court, he had frequent twinges of fear—fear that he had lost his trump—fear at remembering the face of the murdered man. He told himself that he was being silly and tried to pay attention to the trial.

At last, he was permitted to tell his story. He told it factually, though he minimized the episode of Roseen.

The prosecutor's ridicule was sharp and immediate. He pointed out that Remble's first encounter with his mysterious betrayer had supposedly occurred just when, as the court knew, he had actually been engaged in the purchase of the murder weapon. The prosecutor held up the fateful F-gun histrionically. His tone of conviction was so deep and resounding, that Remble almost believed it himself, and for a moment he began to wonder whether Roseen had really existed.

Then his hair stood on end. He saw her, Roseen, right before his eyes. She had come into the courtroom and was sitting in the front row of spectators, watching him with curiosity. He did not hear the next question of the prosecutor, but pointed at her and sputtered incoherently.

"What are you doing?" said the

prosecutor sharply. "Sit down!"

"There she is!" shouted Remble.
"Roseen! Tell them what happened!"

Roseen looked behind her, as if to see at whom he was pointing. The prosecutor glared at the spectators, seeking the cause of the trouble. The judge rapped for order.

"The prisoner will control his voice and tell the court just what he is talking about."

Remble turned wildly to the judge. If he had lost his trump, this might be a chance to gain another. "Your honor, the girl who was with me at the time when I am accused of buying the gun is right here in the courtroom. She will surely tell the court what really happened during those hours, so that I may be cleared of this crime which I did not commit." He turned to Roseen. "Roseen," he pleaded, "tell them you were with me. They are accusing me of premeditation."

The judge rapped again. "Now, Messer Remble, just what person in this courtroom are you addressing as 'Roseen'? Can you point her out?"

"Am I permitted to leave this chair?"

The judge signaled a guard, who came over to Remble and took his arm. Remble rushed across the room, with the guard, and leaned over the rail into Roseen's terrified face. "Roseen, you can save my life! Tell them you were with me all evening, and that I had no gun and bought no gun. Tell them!"

Brief anguish appeared on Roseen's face, but then she achieved a mask of stone behind which he could not see. Remble stopped. He stood up. Dismay was in his face. The guard led him back to the witness stand.

"No further questions," said the prosecutor.

Remble stepped down and took his place in the dock.

"I would like," said the prosecutor, "to call this young lady to the stand."

"Very well," said the judge.

Roseen took the stand. Remble's hopes rose again, as she cast him a momentary glance of compassion. He remembered how she had looked in the car, frightened and soft and pretty.

"What is your name?" said the prosecutor.

Roseen's mask returned. "Essa Bofti."

Remble felt sick. He told himself again that he had nothing to worry about, but it was no use. He was scared. He cursed Verdurilend and all Verdurians.

"Have you ever seen the prisoner before?"

"Never!"

"Thank you."

"No questions," said the attorney which the state had kindly provided for Remble's defense.

The jury was out only five minutes.

"What is your verdict?"

"We find that the prisoner is guilty of the premeditated murder of the late

Mayor Bone—”

Duplicator men rushed from the courtroom to their machines outside.

“Sentence will be pronounced immediately,” said the judge.

There was a great commotion at the entrance of the courtroom. A few of the duplicator men burst back through the door, followed by a distraught court official, who rushed up to the prosecutor and whispered something in his ear.

The judge rapped for order, and his face got red.

The prosecutor’s face was deathly white.

A familiar voice spoke at the door, and every head in the room turned.

Standing in the doorway, flanked by family and secretaries, was the Mayor of Ohndive, Ekkle Bone.

“Luckily,” the mayor said to Remble, handing him a glass of strong wine, “one of the powers of my office is the pardoning of criminals.” He smiled ironically. “Though, I did not think I would have to use that power on your behalf.” He shook his head. “They certainly built up a case against you quickly. It is fortunate I returned as soon as I did, or they would have had you hemmed and buried.” Remble shuddered. The mayor chuckled, watching him, and then his face darkened. “Poor Morgel was not so lucky.” He sighed. “Well, he took his chances. His family has been provided for.” He smiled again.

“How did you like the deception, Remble?”

Remble grimaced. “It was too good.”

“Why?”

“I thought you had come back too soon. I thought you had been killed. During the trial, the idea that it was really you kept bothering me. That’s why I put on such a good performance. Toward the end, I believed my part.” He breathed deeply, feeling the relief of being safe again.

The mayor nodded. “No one but my wife and daughters knew about Morgel. The servants were all deceived, too.” He chuckled. “That is why my butler wanted to kill you.”

Remble did not enjoy the memory of the vengeful butler. He changed the subject. “I wish I could have seen the postmaster’s face when he heard you were back from the dead.”

The mayor was grim. “I will see it later on.”

“Will you take legal action against him?”

“Oh, no.” The mayor offered Remble a cigar. “That would be too difficult here in Verdurilend. With our meager machinery for law enforcement, evidence would be almost impossible to gather. You are the best witness, and you are a convicted criminal—but pardoned, my boy, pardoned.” The mayor laughed at Remble’s expression. In a moment, Remble laughed, too.

“We Verdurians can be so free of

crime, and of policemen, because our people voluntarily obey the law. They accept it freely. The Lawless Days are merely a reminder of that, the proof that lawfulness is voluntary. To catch an outlaw in Verdurilend is very difficult. The postmaster is an outlaw. He leads the repeal movement. He talks morality by day and premeditates by night. He hopes that repeal will bring a great standing police force and all the graft and corruption which such organizations create. He hopes to make lawfulness involuntary, and so, bring it into disrespect."

The mayor snorted. "If I had known of his plans sooner, perhaps I could have tried to secure evidence. As it was, my informant reached me only two days before I talked to you in Schistone. We had to act quickly."

The mayor flicked the ash of his cigar. "In a sense, we have caught the postmaster. But, in another sense, we have only warned him. He will be more careful now."

Remble moved and was aware again of the rich texture of the clothing which the mayor had procured for him, to replace his former tatters. "What will you do about him, then?"

The mayor sat down, with an air of business. "I want to discuss that with you, Remble. Next year, of course, there will be three more Lawless Days. He will undoubtedly leave the country, fearing reprisal. I will be informed of his movements. My

source of information has proved reliable, and it will continue, I am sure. I shall know where he goes, and when, and with whom."

The mayor looked solemnly at Remble. "I need a man to dispose of the postmaster. You are able and trustworthy and experienced. I am very pleased with you. You are the man I need."

Remble opened his mouth to speak, but the mayor continued. "He is a murderer. He will kill again. He is an outlaw. Our law cannot touch him. Someone must do this job, for Verdurilend—and for Morgel." The mayor looked hard at Remble. "Will you accept the job?"

Remble stuttered. "I am a Tandinian. Our customs are different—"

"He would have had you hemmed and buried the next day."

"I know."

"He didn't hesitate, and he wouldn't again."

"Yes, I know that—"

"There is no other way to stop him."

"It seems not, but—"

"Remble, do you remember Essa Bofti, alias Roseen?" The mayor's eyes twinkled.

Remble blushed. "Of course I do!"

"Wherever the postmaster goes, she will go with him."

Remble's jaw dropped.

"She is his secretary."

Remble looked grim. He tried to forget that there was anything de-

sirable about Roseen. No wonder she had not helped him at the trial! Now it was clear.

The mayor watched him, smiling. "She is his secretary, Remble—but she is my informant. It was Essa who told me about the plan which we succeeded in sidetracking by introducing you as a stray element."

Remble interrupted. "Did she know about me?"

The mayor shook his head. "No more than you did about her. I didn't trust her then. I do now."

Remble smiled. He looked into the distance. Roseen's dark impassioned face was in his mind. He remembered the taste of her lips. He knew he was a fool.

"... And if you do your job well," the mayor was saying, "she'll be unemployed. It might be a chance to renew an old friendship—on a better basis."

"I accept the job," Remble said.

As the mayor's car drove him to the border, Remble measured the peaceful towns of Verdurilend, the lazy herds grazing in the afternoon sun, the confident people walking the quiet roads and orderly streets. Clearly this was a land where law was custom, and custom, law. It would be, he thought, a good place to settle down—if one could find the right person. It would be serene and secure—all but three days of the year.

THE END

THE ANALYTICAL LABORATORY

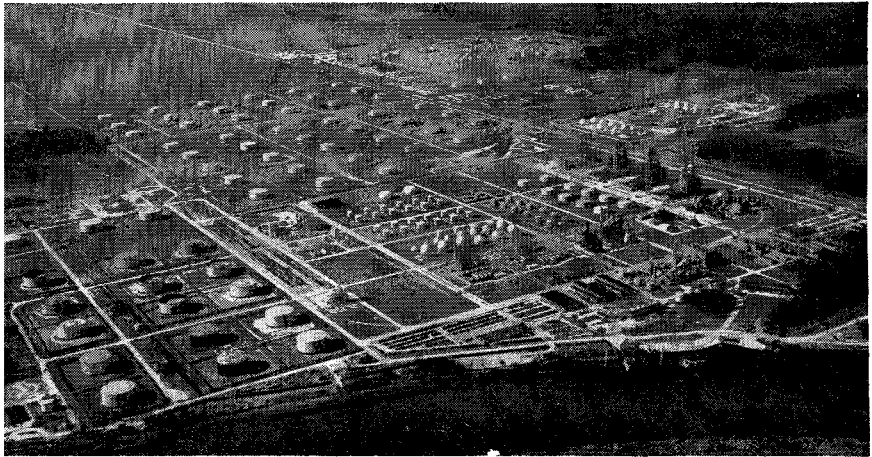
The space for comment this time is limited; it is perhaps no startling surprise that "Currents of Space," took first place. Isaac Asimov's been doing that sort of thing for just about a dozen years now — which, in a young field, makes him an old writer! (But doesn't make Asimov an old man; he, like many another top science-fictioneer, was an undergraduate when he started writing!)

But after Asimov's first-place lead, it was very nearly a tie, actually; there's only a 0.5 point spread between No. 2 spot and No. 5!

OCTOBER, 1952 ISSUE

Place	Story	Author	Points
1.	Currents of Space (Pt.I)	Isaac Asimov	2.11
2.	The Big Hunger	Walter M. Miller, Jr.	2.88
3.	Survival Policy	Edwin James	2.92
4.	The Exile	Alfred Coppel	3.20
5.	The Evidence at Hand	Dean McLaughlin	3.31

THE EDITOR.



Cities Service Company

Aerial view of the Cities Service Refinery at Lake Charles, Louisiana, one of the world's most modern industrial assemblies. Less than a decade ago this two thousand three hundred acre site was a wilderness of brush and scrub pine woods. The Calcasieu River in the foreground provides water for the cooling processes of the refinery and gives access for ocean-going tankers to the Gulf of Mexico twenty-nine miles away.

OIL, SECRET AGENTS AND WOOLLY BEARS

BY WALLACE WEST

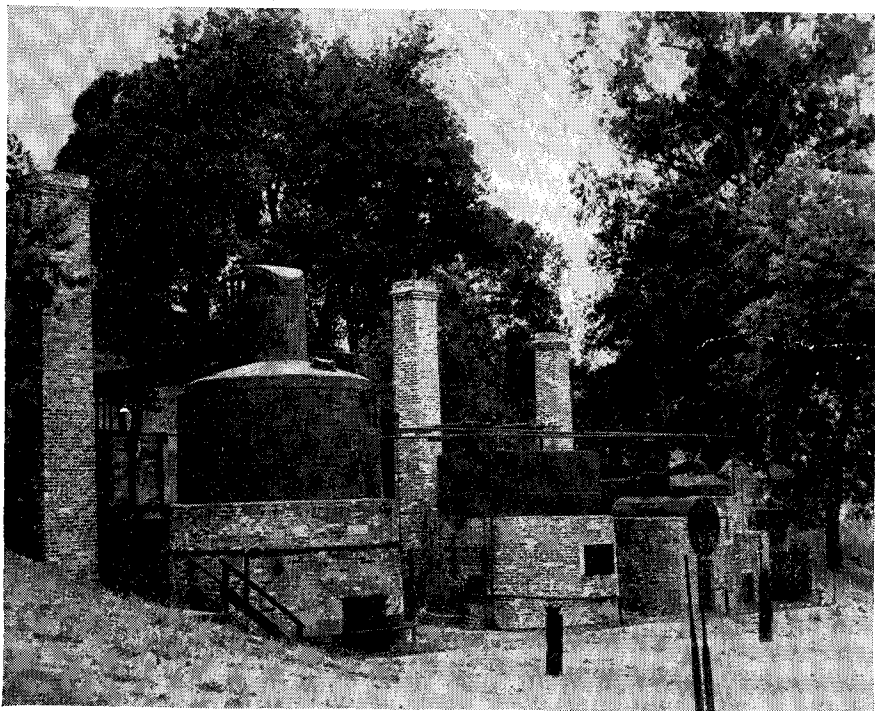
Once, we got a little oil out of the ground, and distilled out the fractions it contained. Now—we have to have a river of oil, and we take the molecules apart, pick up the pieces, and put 'em together the way we want 'em! But not without effort . . .

A woman, a dog and a hickory tree;
The harder you beat 'em, the better
they be.

The truth of that old saw may be questionable in so far as animate objects are concerned. It does apply neatly to the refining of petroleum if the proviso is added that it may require more beating than the laws of

economics permit to change a bulldog crude oil into products having greyhound characteristics.

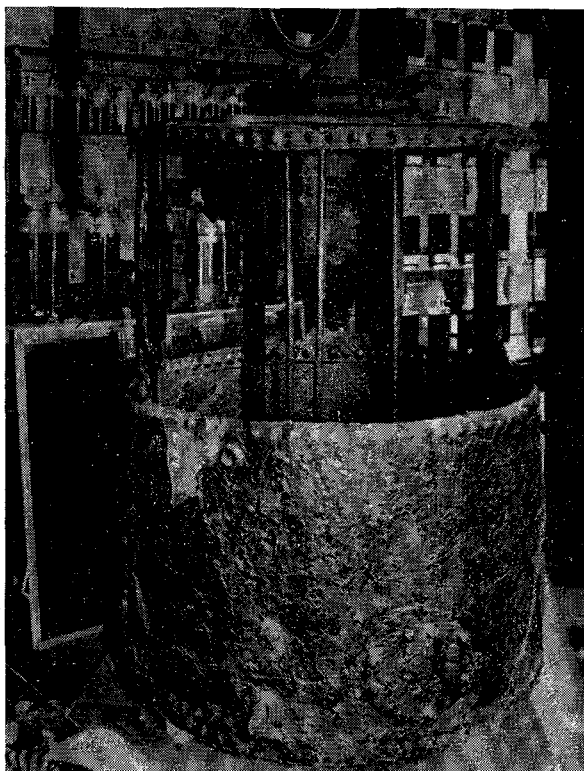
A crude naturally containing a large percentage of heavy fuel oil components *can* be mauled in an ultra-modern catalytic cracking plant until much of it is transformed into high-octane gasoline. But the refiner foolish enough to run such a refractory crude



American Petroleum Institute

One of the early refineries, built in 1876 at Newhall, California, to handle crude oil from the Pico Canyon. Heated crude passed through the series of stills. Each unit removed a different product by distillation.

Remnants of Samuel Kier's second petroleum still at the Drake Museum in Titusville, Pennsylvania. Colonel Edwin L. Drake drilled the first commercially successful oil well near Titusville in 1859.



American Petroleum Institute

when he can get a more amenable one will go bankrupt.

Put it this way: A housing contractor who called any lumber company and said "Send me a thousand feet of boards" would be in need of medical or psychiatric attention. Carpentry is a flexible trade, but 2 x 4's make poor flooring and it is not wise to substitute mahogany for knotty pine.

Just as there are as many types of woods, each having its own use, as

there are species of trees, so there are as many kinds of crude oil as there are oil fields. Before plans for a new refinery are drawn, therefore, its management must be assured of an adequate supply of the right crudes so the plant can be designed to make products required by the market.

Solution of this supply problem depends on prior solution of a host of other puzzles. These include size of plant, equipment desired, location,

transportation and utility facilities available, size and type of market, the degree of competition existing, prices, taxes, economic trends and so forth and so on. A bad guess in any one of these categories may spell financial disaster.

Since it would be impossible to deal with such sideband questions in an article of this length, let us go about the main problem in a grand manner and assume that the refining company, or the integrated company of which it is a part, has one hundred million dollars to invest. Careful surveys indicate that its primary market will be along the East Coast where there is an apparent demand for a new super-duper, antiknock, antirust, anti-everything-else-that's-bad gasoline. A location is chosen on a good harbor in Louisiana where the plant is accessible to crude and products-carrying pipelines, ocean tankers, river barges and railways.

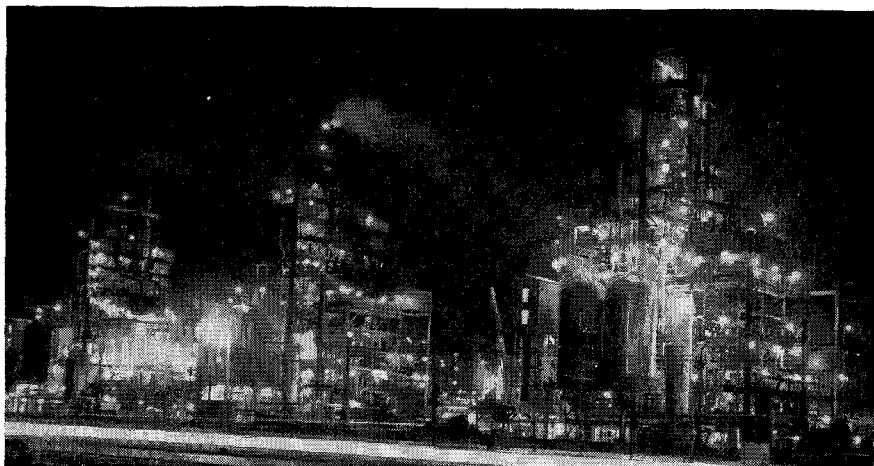
There is enough fresh water available at the site to supply the plant with two hundred six thousand gallons a minute. Enough electricity can be obtained to equal the power demand of Omaha and sufficient natural gas to serve Milwaukee.

So a plant is built with the crude oil capacity of one hundred fifty thousand barrels daily. Its most striking units are three catalytic crackers, each as high as a seventeen-story building. Through them four hundred fifty tons of powdered catalyst flow constantly

at the rate of thirty tons a minute. There are three hundred eighty-five general process tanks and towers for stripping, fractionating, chemical processing, et cetera. Forty-five hundred recording and indicating instruments occupy twenty-five large control panels. Two and a half million feet of pipe lines, six million feet of tubing and eight hundred pumps keep the refinery flow in motion. The staff consists of one thousand eight hundred fifty men and women, most of them highly skilled (The above approximate specifications for the Cities Service Refining Corporation's Lake Charles, Louisiana, refinery.)

From this careful advance planning, it might be presumed that, when the new plant goes "on stream," its charging stock will consist of San Joaquin crude from Venezuela. San Joaquin is an extraordinary oil that can be made to yield about fifty per cent high grade gasoline with very little persuasion.

But that doesn't necessarily follow. San Joaquin is a premium price oil. The supply is limited and may have been sewed up by competing refineries. The new plant has the latest equipment for cracking and reshaping molecules of petroleum to suit specification so San Joaquin may be a luxury. And, after all, though Super-Duper gasoline is the refinery's primary product, it isn't the only one. During the winter months the demand for fuel oil exceeds it, making refining profitable.



Cities Service Company

The Cities Service Refinery at Lake Charles works night and day throughout the year. Outlined in the glitter of thousands of lights on their steel frameworks, these catalytic cracking units rearrange the atoms of the petroleum molecule into components of aviation gasoline and other products vital to the modern world. Each giant unit processes thirty thousand barrels of crude oil in its twenty-four-hour day.

ble in what otherwise would be a slack period. And, because San Joaquin yields so much gasoline by simple distillation, it is necessarily short of heating oil components.

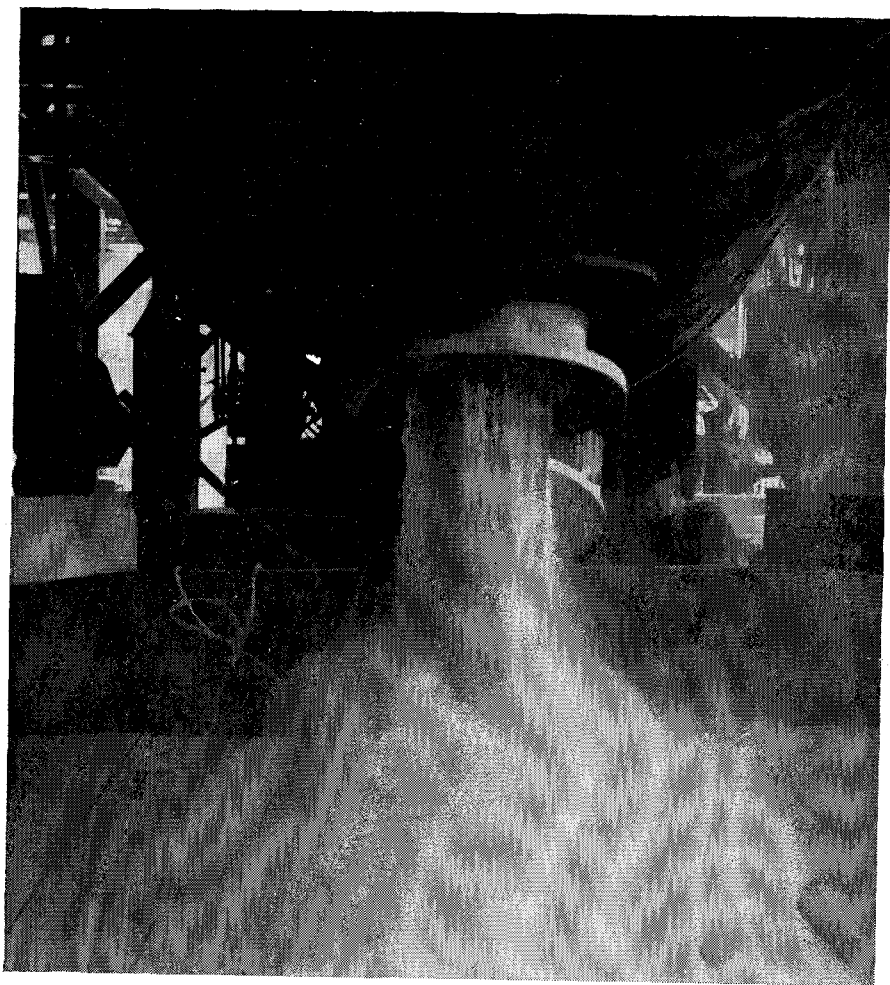
So what happens? Plant technologists specializing in such matters have advised the manager that there is no such thing as a perfect "gasoline crude." (One family of condensate crudes does yield as much as eighty per cent gasoline but it is by no means of Super-Duper quality.) The manager has refused to put his eggs in one basket by purchasing all of his stock from one field. (He remembers that he once did this and got into serious diffi-

culties. The producer, finding that his field was becoming exhausted, drilled wells to a deeper "horizon" and came up with an oil of decidedly different characteristics than that which his shallower wells had provided.)

Instead, the refiner has purchased supplies of several reasonably satisfactory crudes at reasonably satisfactory prices and has pre-adjusted his equipment to beat the greatest possible amounts of gasoline out of them at the lowest possible cost. As a sort of "swing man" on his team of crudes he has acquired some general purpose stock, such as East Texas

crude. This contains thirty-three per cent gasoline, nineteen per cent kerosene, ten per cent heating oil, fifteen per cent gas oil — which can be cracked

into other products — thirteen per cent lubricating oil distillate and ten per cent fuel oil and asphalt. It is a safe bet that he has *not* bought any



Standard Oil Co. (N. J.)

Catalyst being drawn from bottom of catalytic cracker during a shut-down for repairs.



Standard Oil Co. (N. J.)

Synthetic (RHB butyl) rubber control house at Humble Oil and Refining Company plant at Baytown, Texas.

Panuco crude from Mexico. Panuco contains sixty-five per cent asphalt and is of interest mainly to refiners who specialize in that sticky product.

But what are reasonably satisfactory crudes? To answer that, we will have to dip into organic chemistry. In brief, petroleum is made up mainly of hydrogen and carbon atoms arranged in hydrocarbon molecules. If all hydrocarbons had the same number of atoms of each type, joined together in the same fashion, crude oils would all be the same. But hydro-

carbons exist in untold numbers.

They are connected in long chains, short chains, branched chains, rings and curlicues. Some are saturated with hydrogen; some are hydrogen-hungry. As a result, some crude oils are black while others range through reddish brown to yellow. Some are as fluid as water; others are so tarry they hardly flow unless heated. A few are almost odorless; others smell like cleaning fluid and some, because of the sulphur they contain, stink like rotten eggs.

Back in the late 1840s Samuel Kier,



Standard Oil Co. (N. J.)

Control lines on roof of RHB butyl rubber control house. They lead from panel instruments to various units of the Baytown refinery.

young owner of a string of river barges operating out of Pittsburgh, decided that, since petroleum smelled so bad, it must have great medicinal value. (He and his father owned several salt wells that had become contaminated by crude oil seepages and were trying to find a way of turning a dead loss on the salt into an asset.) So Kier hired flashily-painted buckboards, high-stepping horses and circus barkers. He turned them loose on the countryside to sing the praises of

"Rock Oil Nostrum."

One of the placards they carried screamed:

"Hurry! Hurry! Hurry! Before this wonderful product is depleted from Nature's laboratory!"

Another chanted:

"This healthful balm, from Nature's secret spring,
The bloom of health and life to man will bring;
As from the depths this magic

liquid flows,
To calm our suff'rings and assuage
our woes."

When the canny Pennsylvania Dutch refused to part with dollars for the stuff, Sammy ran off on another tack. He cooked the noxious nostrum in a kettle on his kitchen stove and came up with a substitute for the "coal oil" that was just replacing whale oil in the lamps of the nation. Kier was the first man to distill crude oil into groups of lighter and heavier hydrocarbon parts or fractions. (Even today it is a difficult task to split a single hydrocarbon molecule from its next door neighbor.)

Kier and his immediate successors were interested mainly in that profitable kerosene cut. They poured the lightest fraction, then called naphtha and now known as gasoline, into the nearest stream. The results sometimes were spectacular!

Straight run distillation, with minor improvements, continued until the Model T Ford and other mass-produced, inexpensive automobiles created a demand for tremendous quantities of gasoline. But distillation could provide only about eighteen per cent gasoline with modest anti-knock qualities from each barrel of crude!

Three alternatives faced automotive and oil men: (1) Motors must be developed efficient enough to operate on the total amount of low-octane distilled fuel available. (2) Much more

crude would have to be processed to meet the increased demand for gasoline even though other products distilled with the gasoline had to be destroyed. (3) A method for boosting the gasoline fraction must be found.

Then and there a running fight developed between the two industries which has continued to the present day. Many oil men contend that auto manufacturers fumbled motor development while petroleum researchers perfected the thermal cracking of more and higher-octane gasoline out of given quantities of crudes. However that may be, history records that Dr. William M. Burton, director of research for the Standard Oil Company of Indiana, invented thermal cracking while the dispute was at its height. His process used extremely high temperatures to break large and complicated hydrocarbon molecules into the smaller ones needed to make gasoline with excellent anti-knock qualities. Cracking was done under pressure to keep the size of the stills within reasonable limits.

The first battery of Burton stills went into operation in 1913. It doubled the amount of gasoline obtainable. In 1909, average gasoline yield from a barrel of crude was 4.5 gallons, or 10.7%. In 1914 it jumped to 7.6 gallons of 18.2%. By 1917 it was up to nine gallons or 21.5%. Today, it is theoretically possible to crack seventy per cent gasoline out of the crude barrel but, in practice, the average

hovers around forty per cent.

Cleveland and Williamson, in their book "The Road is Yours," claim the switch to cracked gasoline, combined with widespread use of tetra-ethyl lead as an anti-knock additive, conserved a billion gallons of crude oil that otherwise would have had to be processed during the last quarter century. Other experts contend that, by postponing development of anti-detonating engines and light "foreign type" cars, cracking, plus lead, has wasted an equal amount of petroleum during that period. Eugene Ayres of the Gulf Research and Development Company, even declares that the switch from thermal to the more recent catalytic cracking is causing the loss of from sixty to one hundred million barrels of oil every year.

Air Force requirements for 100-octane gasoline plus insistent demands by auto makers for fuels with high anti-knock ratings were responsible for the current swing to catalytic cracking. This remarkable but expensive process provides the chemical components needed for the blending of modern aviation gasoline and for the production of petrochemicals.

Catalysts may well be called the secret agents of present-day refining processes. They make it possible to crack more gasoline — or other complicated products as required — from a given quantity of petroleum, but they undergo no chemical change whatsoever in the process. Nobody

yet knows why a finely ground inert powder, such as alumina-silica gel, should be able to make hydrocarbon molecules tear themselves apart and recombine. Theories on the subject are little more than wild guesses. Years, perhaps decades, of experimentation may be necessary before the explanation is found.

Catalytic cracking operates with less heat and pressure than thermal cracking to avoid carbon contamination of the catalyst. Conversely, the apparatus required for the process must be huge, and fabulously expensive. In partial compensation, the process allows a refiner to vary product yields more widely and more quickly to suit changing conditions.

The reverse of catalytic cracking is polymerization. This combines small, unsaturated hydrocarbon molecules into large ones that resemble tangled masses of fishhooks under the electronic microscope. Polymers may be fed hydrogen to make them suitable for blending into aviation gasoline with anti-knock qualities running right off the top of the old octane-rating scale. Or polymers may be used for manufacture of plastics, synthetic rubber and a vast and growing number of other petrochemicals. In the laboratory, hydrogenation of polymers can be made to produce more than forty-two gallons of products out of a forty-two-gallon barrel of crude!

It can be seen from all this that

modern chemistry rebuilds hydrocarbons in fundamental ways. It is now possible to make almost any desired product from any crude. But to do so on a commercial scale would, at present, be prohibitively expensive and wasteful, except in emergencies. So a refiner still endeavors to buy crudes that need as little mauling as possible. Some, like the East Texas crudes, the Mid-Continents from the Central Midwest and the Jusepin of Venezuela, he earmarks as general-purpose stock. Others are held as "specialties," desirable as sources of some particular product or group of products.

Numerous Texas crudes such as Loma Novia, Flour Bluff, Refugio, Sweden and Miranda, are prized as sources of one or several of the middle distillates such as kerosene, Diesel fuel and heating oil. Colombian, Panhandle, Pennsylvania and Rodessa — Louisiana — are rich in lubricating oils. Talang Akar, from Sumatra, is, like San Joaquin, an excellent source of wax. Talco — Texas — rivals Panuco in asphalt content. A few crudes have the disturbing property of producing gasoline which operates much better in automobiles than its octane rating justifies.

The refiner's problems are not solved, however, when he obtains a steady and balanced supply of specialty and general-purpose crudes. Most of his stock will contain impurities that must be removed or kept

below a specified level so they do not become obnoxious or positively harmful.

West Texas sour crudes, to cite just one example, contain hydrogen sulfide and other sulfur compounds called mercaptans. Tank gaugers must wear gas masks for protection against dangerous concentrations of such vapors. The chemicals have to be neutralized to prevent corrosion of refinery and automobile engine metals and to avoid offending the delicate nostrils of motorists.

Plenty of other impurities must be dealt with. Salt, magnesium chloride and plain old-fashioned H_2O are just a few of them. In addition, the crudes to be purchased must be judged according to their pour points, viscosities and specific gravities. Lighter crudes usually cost more because of their desirable qualities although other factors, such as accessibility, quantity and transportation charges, enter this equation.

All of these factors, and many more, are determined by means of a "crude assay." The United States Bureau of Mines Evaluation Report provides a partial assay extending back many years, but most of such analysis is done in company laboratories and is kept secret for obvious reasons. The petroleum industry, after all, is a highly competitive business. In refining, the largest profits go to the companies that know their crudes best.

Three crude assay laboratories in

the United States and others in foreign countries are operated by affiliates of the Standard Oil Company of New Jersey and the same situation holds true with its competitors. Every crude that Jersey refineries run, or that they may be called on to run, is put through a refining process in miniature from time to time. The assay determines what products can best be made from a crude; what quality those products will have and what quantity of them can be manufactured. About two days are required to distill a fifteen-gallon sample for assay and much longer to compile data based on it.

The reports are in constant use at all refineries for evaluation studies — studies that determine how various crudes can be used most efficiently by the equipment available at each plant. They result in a so-called “running plan” that allocates various crudes to different refinery units and estimates expected yields of products.

Collection of the information that helps to shape a refinery's monthly running plan starts a year or more in advance and is approached from different angles by different firms. One major company, for example, set up a Manufacturing and Marketing Committee to do the job. Membership consists of sales and refinery managements. They hold regular meetings, co-ordinate operations and review conditions every three months in the light of past performance. They take

into consideration industrial developments in the nation, records of weather conditions that prevailed in years gone by and estimates of the sales managers as to their future needs for various products.

An executive secretary in the New York territorial office compiles the figures gathered, always keeping in mind that it is the nature of salesmen to be over-optimistic in their estimates. Then the Committee balances allocations against refinery yields. It may order a change in runs to obtain more of one product such as gasoline at the expense of another, such as fuel oil. It may buy or sell crude to a competitor if it finds the refinery underloaded or overloaded. It may, perish the thought, resort to buying gasoline! After all, the only difference between Super-Duper and another fuel having similar basic specifications is the secret additive put into it somewhere along the line before it reaches the service station pump.

Above all, however, the running plan committee tries to appraise the lag that always occurs between refinery cup and consumer lip. A big cat cracking plant must, of necessity, operate from six months to a year ahead of actual consumption. It is, in effect, a highly efficient time machine. Today it makes products that will be consumed several hundred days-after-tomorrow.

Take gasoline as an example: Its quality must be changed four times a

year to make it start easier in winter, be less subject to vapor lock in summer, et cetera, et cetera. But what if winter hangs on and users of spring season Super-Duper find their cars hard to start? Or what if the winter is so mild that motorists do a lot more driving than the Committee had expected, with a resultant increase in their consumption? Well, there usually is enough excess gasoline storage capacity available so that adjustments can be made. There *will* be a great deal of scurrying around in refineries to change the settings of fractionating towers and other equipment so they will produce excess supplies of the type of gasoline needed or vice versa.

But an extraordinarily mild or cold winter really can play hob with the fuel oil market. Storage tanks for that particular product usually are "tight." If home owners don't consume their allotted quota, million-gallon tanks at refineries and bulk plants can slop over within a few weeks. Experiments now are under way looking toward the pumping of excess supplies back into exhausted oil fields. This works with gas but the experts are divided in their opinion regarding its feasibility for liquid products.

On the other hand, an abnormally cold winter such as that of 1947-48 quickly can put the shoe on the other foot. Luckily, long-range weather predictions and past experience hinted that it was coming. Oil companies, early in the summer, started a concen-

trated drive to induce fuel oil users, as well as marketers, to fill their tanks to capacity.

Even so, it was nip and tuck for a few blizzardy weeks. Oil in storage ran low. Transportation was not always sufficient to meet the emergency and spot shortages developed in a few northern communities. (Those were the days, you may remember, when crack streamliners were sidetracked to let long freights made up entirely of tank cars be highballed straight through to the affected areas at express train speeds.) And refineries that had been running gasoline for the following summer switched frantically back to fuel oil during the emergency.

But what if another war breaks out suddenly? Or what if an, ah, recession begins? What if atomic power, sun power or tide power — to say nothing of heat pumps, jet automobiles and such futuristic dreams — become realities? Ask questions like that of a refinery man and his eyes will take on a high glaze. Whisper to him that some day America's petroleum supply may run low and he may start screaming. If you mention government ownership be prepared for the worst!

Joking aside, those responsible for refinery running plans take an almost pathological interest in long-range predictions of all kinds. The recent report of the President's Materials Policy Commission estimating a one hundred per cent increase in the demand for petroleum products during the next

quarter century is being studied, paragraph by paragraph. Advances in the processes for synthesizing liquid fuels from America's practically limitless supplies of oil shales and coal are being watched with bated and, it must be admitted, often blasphemous breath.

Oil companies pay careful heed to the long-range predictions put out by the United States weather bureau and many subscribe to similar forecasts made by private organizations. The book dealing with economic, political, weather, price, population, sunspot and other cycles which was written

in 1947 by Edward R. Dewey and Edwin F. Dakin stands right next to the Bible in some oil company offices. At least two responsible oil men have started collections of woolly bears, those caterpillars which may—or may not—predict the severity of coming winters by the thickness of their fur.

"After all," these traffickers in the future say in effect, "such forecasts may mean much or little. But what can we lose by studying them? People who operate time machines should be wary of those who throw cycles."

THE END

IN TIMES TO COME

Next month's issue leads off with a yarn "Thou Good And Faithful" by a new author, John Loxmith. When the exploring parties set out from Earth to explore the stars, they're going to have problems to meet . . . and not very predictable ones! Suppose they encounter a race of highly hostile, parasitic telepaths? Or a race that is barbarically savage—but capable of controlling minds? Or a race that's hyper-advanced, and also given to hermitude protected by armed force? "Civilization" is as hard to define as "science fiction" and even harder to predict!

Earth's interstellar explorers have to be prepared for almost anything. But in "Thou Good and Faithful" they met a situation they had *not* been prepared for. But that was simply because Earth's particular brand of civilization hadn't developed far enough to understand very well what the aliens were like . . .

I'd like to mention again that beginning with the April issue—month after next—both I and the authors will be even more acutely interested in your letters. The story your opinions show to be the favorite in the issue might, from April on, get an extra bonus. Your letters will decide the issue.

THE EDITOR.



CRUCIFIXUS ETIAM

BY WALTER M. MILLER, JR.

Animals learned that if you killed, you could eat. Man moved higher; he learned that if you sowed in the spring, you could reap in the fall. But there's a step still to go . . .

Manue Nanti joined the project to make some dough. Five dollars an hour was good pay, even in 2134 A.D., and there was no way to spend it while on the job. Everything would be furnished: housing, chow, clothing,

toiletries, medicine, cigarettes, even a daily ration of one hundred eighty proof beverage alcohol, locally distilled from fermented Martian mosses as fuel for the project's vehicles. He figured that if he avoided crap games, he

could finish his five-year contract with fifty thousand dollars in the bank, return to Earth, and retire at the age of twenty-four. Manue wanted to travel, to see the far corners of the world, the strange cultures, the simple people, the small towns, deserts, mountains, jungles—for until he came to Mars, he had never been farther than a hundred miles from Cerro de Pasco, his birthplace in Peru.

A great wistfulness came over him in the cold Martian night when the frost haze broke, revealing the black, gleam-stung sky, and the blue-green Earth-star of his birth. *El mundo de mi carne, de mi alma*, he thought—yet, he had seen so little of it that many of its places would be more alien to him than the homogenously ugly vistas of Mars. These he longed to see: the volcanoes of the South Pacific, the monstrous mountains of Tibet, the concrete cyclops of New York, the radioactive craters of Russia, the artificial islands in the China Sea, the Black Forest, the Ganges, the Grand Canyon—but most of all, the works of human art, the pyramids, the Gothic cathedrals of Europe, *Notre Dame du Chartres*, Saint Peter's, the tile-work wonders of Anacapri. But the dream was still a long labor from realization.

Manue was a big youth, heavy-boned and built for labor, clever in a simple mechanical way, and with a wistful good humor that helped him take a lot of guff from whisky-breathed foremen and sharp-eyed engineers who

made ten dollars an hour and figured ways for making more, legitimately or otherwise.

He had been on Mars only a month, and it hurt. Each time he swung the heavy pick into the red-brown sod, his face winced with pain. The plastic aerator valves, surgically stitched in his chest, pulled and twisted and seemed to tear with each lurch of his body. The mechanical oxygenator served as a lung, sucking blood through an artificially grafted network of veins and plastic tubing, frothing it with air from a chemical generator, and returning it to his circulatory system. Breathing was unnecessary, except to provide wind for talking, but Manue breathed in desperate gulps of the 4.0 psi Martian air; for he had seen the wasted, atrophied chests of the men who had served four or five years, and he knew that when they returned to Earth—if ever—they would still need the auxiliary oxygenator equipment.

"If you don't stop breathing," the surgeon told him, "you'll be all right. When you go to bed at night, turn the oxy down low—so low you feel like panting. There's a critical point that's just right for sleeping. If you get it too low, you'll wake up screaming, and you'll get claustrophobia. If you get it too high, your reflex mechanisms will go to pot and you won't breathe; your lungs'll dry up after a time. Watch it."

Manue watched it carefully, although the oldsters laughed at him—in their

dry wheezing chuckles. Some of them could scarcely speak more than two or three words at a shallow breath.

"Breathe deep, boy," they told him. "Enjoy it while you can. You'll forget how pretty soon. Unless you're an engineer."

The engineers had it soft, he learned. They slept in a pressurized barrack where the air was ten psi and twenty-five per cent oxygen, where they turned their oxies off and slept in peace. Even their oxies were self-regulating, controlling the output according to the carbon dioxide content of the input blood. But the Commission could afford no such luxuries for the labor gangs. The payload of a cargo rocket from Earth was only about two per cent of the ship's total mass, and nothing superfluous could be carried. The ships brought the bare essentials, basic industrial equipment, big reactors, generators, engines, heavy tools.

Small tools, building materials, foods, non-nuclear fuels—these things had to be made on Mars. There was an open pit mine in the belly of the Syrtis Major where a "lake" of nearly pure iron-rust was scooped into a smelter, and processed into various grades of steel for building purposes, tools, and machinery. A quarry in the Flathead Mountains dug up large quantities of cement rock, burned it, and crushed it to make concrete.

It was rumored that Mars was even preparing to grow her own labor force.

An old-timer told him that the Commission had brought five hundred married couples to a new underground city in the Mare Erythraeum, supposedly as personnel for a local commission headquarters, but according to the old-timer, they were to be paid a bonus of three thousand dollars for every child born on the red planet. But Manue knew that the old "troffies" had a way of inventing such stories, and he reserved a certain amount of skepticism.

As for his own share in the Project, he knew—and needed to know—very little. The encampment was at the north end of the Mare Cimmerium, surrounded by the bleak brown and green landscape of rock and giant lichens, stretching toward sharply defined horizons except for one mountain range in the distance, and hung over by a blue sky so dark that the Earth-star occasionally became dimly visible during the dim daytime. The encampment consisted of a dozen double-walled stone huts, windowless, and roofed with flat slabs of rock covered over by a tarry resin boiled out of the cactuslike spineplants. The camp was ugly, lonely, and dominated by the gaunt skeleton of a drill rig set up in its midst.

Manue joined the excavating crew in the job of digging a yard-wide, six feet deep foundation trench in a hundred yard square around the drill rig, which day and night was biting deeper through the crust of Mars in a dry cut

that necessitated frequent stoppages for changing rotary bits. He learned that the geologists had predicted a subterranean pocket of tritium oxide ice at sixteen thousand feet, and that it was for this that they were drilling. The foundation he was helping to dig would be for a control station of some sort.

He worked too hard to be very curious. Mars was a nightmare, a grim womanless, frigid, disinterestedly evil world. His digging partner was a sloe-eyed Tibetan nicknamed "Gee" who spoke the Omnalingua clumsily at best. He followed two paces behind Manue with a shovel, scooping up the broken ground, and humming a monotonous chant in his own tongue. Manue seldom heard his own language, and missed it; one of the engineers, a haughty Chilean, spoke the modern Spanish, but not to such as Manue Nanti. Most of the other laborers used either Basic English or the Omnalingua. He spoke both, but longed to hear the tongue of his people. Even when he tried to talk to Gee, the cultural gulf was so wide that satisfying communication was nearly impossible. Peruvian jokes were unfunny to Tibetan ears, although Gee bent double with gales of laughter when Manue nearly crushed his own foot with a clumsy stroke of the pick.

He found no close companions. His foreman was a narrow-eyed, orange-browed Low German named Vögeli, usually half-drunk, and intent upon

keeping his lung-power by bellowing at his crew. A meaty, florid man, he stalked slowly along the lip of the excavation, pausing to stare coldly down at each pair of laborers who, if they dared to look up, caught a guttural tongue-lashing for the moment's pause. When he had words for a digger, he called a halt by kicking a small avalanche of dirt back into the trench about the man's feet.

Manue learned about Vögeli's disposition before the end of his first month. The aerator tubes had become nearly unbearable; the skin, in trying to grow fast to the plastic, was beginning to form a tight little neck where the tubes entered his flesh, and the skin stretched and burned and stung with each movement of his trunk. Suddenly he felt sick. He staggered dizzily against the side of the trench, dropped the pick, and swayed heavily, bracing himself against collapse. Shock and nausea rocked him, while Gee stared at him and giggled foolishly.

"Hoy!" Vögeli bellowed from across the pit. "Get back on that pick! Hoy, there! Get with it—"

Manue moved dizzily to recover the tool, saw patches of black swimming before him, sank weakly back to pant in shallow gasps. The nagging sting of the valves was a portable hell that he carried with him always. He fought an impulse to jerk them out of his flesh; if a valve came loose, he

would bleed to death in a few minutes.

Vögeli came stamping along the heap of fresh earth and lumbered up to stand over the sagging Manue in the trench. He glared down at him for a moment, then nudged the back of his neck with a heavy boot. "Get to work!"

Manue looked up and moved his lips silently. His forehead glinted with moisture in the faint sun, although the temperature was far below freezing.

"Grab that pick and get started."

"Can't," Manue gasped. "Hoses—hurt."

Vögeli grumbled a curse and vaulted down into the trench beside him. "Unzip that jacket," he ordered.

Weakly, Manue fumbled to obey, but the foreman knocked his hand aside and jerked the zipper down. Roughly he unbuttoned the Peruvian's shirt, laying open the bare brown chest to the icy cold.

"*No!*—not the hoses, *please!*"

Vögeli took one of the thin tubes in his blunt fingers and leaned close to peer at the puffy, calloused nodule of irritated skin that formed around it where it entered the flesh. He touched the nodule lightly, causing the digger to whimper.

"No, please!"

"Stop sniveling!"

Vögeli laid his thumbs against the nodule and exerted a sudden pressure. There was a slight popping sound as the skin slid back a fraction of an

inch, along the tube. Manue yelped and closed his eyes.

"Shut up! I know what I'm doing."

He repeated the process with the other tube. Then he seized both tubes in his hands and wiggled them slightly in and out, as if to insure a proper resetting of the skin. The digger cried weakly and slumped in a dead faint.

When he awoke, he was in bed in the barracks, and a medic was painting the sore spots with a bright yellow solution that chilled his skin.

"Woke up, huh?" the medic grunted cheerfully. "How you feel?"

"*Maloi!*" he hissed.

"Stay in bed for the day, son. Keep your oxy up high. Make you feel better."

The medic went away, but Vögeli lingered, smiling at him grimly from the doorway. "Don't try goofing off tomorrow too."

Manue hated the closed door with silent eyes, and listened intently until Vögeli's footsteps left the building. Then, following the medic's instructions, he turned his oxy to maximum, even though the faster flow of blood made the chest-valves ache. The sickness fled, to be replaced with a weary afterglow. Drowsiness came over him, and he slept.

Sleep was a dread black-robed phantom on Mars. Mars pressed the same incubus upon all newcomers to her soil: a nightmare of falling, falling, falling into bottomless space. It was the faint gravity, they said, that

caused it. The body felt buoyed up, and the subconscious mind recalled down-going elevators, and diving airplanes, and a fall from a high cliff. It suggested these things in dreams, or if the dreamer's oxy were set too low, it conjured up a nightmare of sinking slowly deeper, and deeper in cold black water that filled the victim's throat. Newcomers were segregated in a separate barracks so that their nightly screams would not disturb the old-timers who had finally adjusted to Martian conditions.

But now, for the first time since his arrival, Manue slept soundly, airily, and felt borne up by beams of bright light.

When he awoke again, he lay clammy in the horrifying knowledge that he had not been breathing! It was so comfortable not to breathe. His chest stopped hurting because of the stillness of his rib-case. He felt refreshed and alive. Peaceful sleep.

Suddenly he was breathing again in harsh gasps, and cursing himself for the lapse, and praying amid quiet tears as he visualized the wasted chest of a troffie.

"*Heh heh!*" wheezed an oldster who had come in to readjust the furnace in the rookie barracks. "You'll get to be a Martian pretty soon, boy. I been here seven years. Look at *me*."

Manue heard the gasping voice and shuddered; there was no need to look.

"You just as well not fight it. It'll get you. Give in, make it easy on your-

self. Go crazy if you don't."

"Stop it! Let me alone!"

"Sure. Just one thing. You wanta go home, you think. I went home. Came back. You will, too. They all do, 'cept engineers. Know why?"

"Shut up!" Manue pulled himself erect on the cot and hissed anger at the old-timer, who was neither old nor young, but only withered by Mars. His head suggested that he might be around thirty-five, but his body was weak and old.

The veteran grinned. "Sorry," he wheezed. "I'll keep my mouth shut." He hesitated, then extended his hand. "I'm Sam Donnell, mech-repairs."

Manue still glowered at him. Donnell shrugged and dropped his hand.

"Just trying to be friends," he muttered and walked away.

The digger started to call after him but only closed his mouth again, tightly. Friends? He needed friends, but not a troffie. He couldn't even bear to look at them, for fear he might be looking into the mirror of his own future.

Manue climbed out of his bunk and donned his fleeceskins. Night had fallen, and the temperature was already twenty below. A soft sift of ice-dust obscured the stars. He stared about in the darkness. The mess hall was closed, but a light burned in the canteen and another in the foremen's club, where the men were playing cards and drinking. He went to get his alcohol ration, gulped it mixed

with a little water, and trudged back to the barracks alone.

The Tibetan was in bed, staring blankly at the ceiling. Manue sat down and gazed at his flat, empty face.

"Why did you come here, Gee?"

"Come where?"

"To Mars."

Gee grinned, revealing large black-streaked teeth. "Make money. Good money on Mars."

"Everybody make money, huh?"

"Sure."

"Where's the money come from?"

Gee rolled his face toward the Peruvian and frowned. "You crazy? Money come from Earth, where all money come from."

"And what does Earth get back from Mars?"

Gee looked puzzled for a moment, then gathered anger because he found no answer. He grunted a monosyllable in his native tongue, then rolled over and went to sleep.

Manue was not normally given to worrying about such things, but now he found himself asking, "What am I doing here?"—and then, "What is *anybody* doing here?"

The Mars Project had started eighty or ninety years ago, and its end goal was to make Mars habitable for colonists without Earth support, without oxies and insulated suits and the various gadgets a man now had to use to keep himself alive on the fourth planet.

But thus far, Earth had planted without reaping. The sky was a bottomless well into which Earth poured her tools, dollars, manpower, and engineering skill. And there appeared to be no hope for the near future.

Manue felt suddenly trapped. He could not return to Earth before the end of his contract. He was trading five years of virtual enslavement for a sum of money which would buy a limited amount of freedom. But what if he lost his lungs, became a servant of the small aerator for the rest of his days? Worst of all: whose ends was he serving? The contractors were getting rich—on government contracts. Some of the engineers and foremen were getting rich—by various forms of embezzlement of government funds. But what were the people back on Earth getting for their money?

Nothing.

He lay awake for a long time, thinking about it. Then he resolved to ask someone tomorrow, someone smarter than himself.

But he found the question brushed aside. He summoned enough nerve to ask Vögeli, but the foreman told him harshly to keep working and quit wondering. He asked the structural engineer who supervised the building, but the man only laughed, and said: "What do you care? You're making good money."

They were running concrete now, laying the long strips of Martian steel in the bottom of the trench and dump-

ing in great slobbering wheelbarrowfuls of gray-green mix. The drillers were continuing their tedious dry cut deep into the red world's crust. Twice a day they brought up a yard-long cylindrical sample of the rock and gave it to a geologist who weighed it, roasted it, weighed it again, and tested a sample of the condensed steam—if any—for tritium content. Daily, he chalked up the results on a blackboard in front of the engineering hut, and the technical staff crowded around for a look. Manue always glanced at the figures, but failed to understand.

Life became an endless routine of pain, fear, hard work, anger. There were few diversions. Sometimes a crew of entertainers came out from the Mare Erythraeum, but the labor gang could not all crowd in the pressurized staff-barracks where the shows were presented, and when Manue managed to catch a glimpse of one of the girls walking across the clearing, she was bundled in fleeceskins and hooded by a parka.

Itinerant rabbis, clergymen, and priests of the world's major faiths came occasionally to the camp: Buddhist, Moslem, and the Christian sects. Padre Antonio Selni made monthly visits to hear confessions and offer Mass. Most of the gang attended all services as a diversion from routine, as an escape from nostalgia. Somehow it gave Manue a strange feeling in the pit of his stomach to see the Sacrifice of the

Mass, two thousand years old, being offered in the same ritual under the strange dark sky of Mars—with a section of the new foundation serving as an altar upon which the priest set crucifix, candles, relic-stone, missal, chalice, paten, ciborium, cruets, et cetera. In filling the wine-cruet before the service, Manue saw him spill a little of the red-clear fluid upon the brown soil—wine, Earth-wine from sunny Sicilian vineyards, trampled from the grapes by the bare stamping feet of children. Wine, the rich red blood of Earth, soaking slowly into the crust of another planet.

Bowing low at the consecration, the unhappy Peruvian thought of the prayer a rabbi had sung the week before: "Blessed be the Lord our God, King of the Universe, Who makest bread to spring forth out of the Earth."

Earth chalice, Earth blood, Earth God, Earth worshippers—with plastic tubes in their chests and a great sickness in their hearts.

He went away saddened. There was no faith here. Faith needed familiar surroundings, the props of culture. Here there were only swinging picks and rumbling machinery and sloshing concrete and the clatter of tools and the wheezing of troffies. Why? For five dollars an hour and keep?

Manue, raised in a back-country society that was almost a folk-culture, felt deep thirst for a goal. His father had been a stonemason, and he had

labored lovingly to help build the new cathedral, to build houses and mansions and commercial buildings, and his blood was mingled in their mortar. He had built for the love of his community and the love of the people and their customs, and their gods. He knew his own ends, and the ends of those around him. But what sense was there in this endless scratching at the face of Mars? Did they think they could make it into a second Earth, with pine forests and lakes and snow-capped mountains and small country villages? Man was not that strong. No, if he were laboring for any cause at all, it was to build a world so unearthlike that he could not love it.

The foundation was finished. There was very little more to be done until the drillers struck pay. Manue sat around the camp and worked at breathing. It was becoming a conscious effort now, and if he stopped thinking about it for a few minutes, he found himself inspiring shallow, meaningless little sips of air that scarcely moved his diaphragm. He kept the aerator as low as possible, to make himself breathe great gasps that hurt his chest, but it made him dizzy, and he had to increase the oxygenation lest he faint.

Sam Donnell, the troffie mech-repairman, caught him about to slump dizzily from his perch atop a heap of rocks, pushed him erect, and turned his oxy back to normal. It was late afternoon, and the drillers were about to

change shifts. Manue sat shaking his head for a moment, then gazed at Donnell gratefully.

"That's dangerous, kid," the troffie wheezed. "Guys can go psycho doing that. Which you rather have: sick lungs or sick mind?"

"Neither."

"I know, but—"

"I don't want to talk about it."

Donnell stared at him with a faint smile. Then he shrugged and sat down on the rock heap to watch the drilling.

"Oughta be hitting the tritium ice in a couple of days," he said pleasantly. "Then we'll see a big blow."

Manue moistened his lips nervously. The troffies always made him feel uneasy. He stared aside.

"Big blow?"

"Lotta pressure down there, they say. Something about the way Mars got formed. Dust cloud hypothesis."

Manue shook his head. "I don't understand."

"I don't either. But I've heard them talk. Couple of billion years ago, Mars was supposed to be a moon of Jupiter. Picked up a lot of ice crystals over a rocky core. Then it broke loose and picked up a rocky crust—from another belt of the dust cloud. The pockets of tritium ice catch a few neutrons from uranium ore—down under. Some of the tritium goes into helium. Frees oxygen. Gases form pressure. Big blow."

"What are they going to do with the ice?"

The troffie shrugged. "The engineers might know."

Manue snorted and spat. "They know how to make money."

"Heh! Sure, everybody's gettin' rich."

The Peruvian stared at him speculatively for a moment.

"Senor Donnell, I—"

"Sam'll do."

"I wonder if anybody knows why . . . well . . . why we're really here."

Donnell glanced up to grin, then wagged his head. He fell thoughtful for a moment, and leaned forward to write in the earth. When he finished, he read it aloud.

"A plow plus a horse plus land equals the necessities of life." He glanced up at Manue. "Fifteen Hundred A.D."

The Peruvian frowned his bewilderment. Donnell rubbed out what he had written and wrote again.

"A factory plus steam turbines plus raw materials equals necessities plus luxuries. Nineteen Hundred A.D."

He rubbed it out and repeated the scribbling. "All those things plus nuclear power and computer controls equal a surplus of everything. Twenty-One Hundred A.D."

"So?"

"So, it's either cut production or find an outlet. Mars is an outlet for surplus energies, manpower, money. Mars Project keeps money turning over, keeps everything turning over. Economist told me that. Said if the

Project folded, surplus would pile up—big depression on Earth."

The Peruvian shook his head and sighed. It didn't sound right somehow. It sounded like an explanation somebody figured out after the whole thing started. It wasn't the kind of goal he wanted.

Two days later, the drill hit ice, and the "big blow" was only a fizzle. There was talk around the camp that the whole operation had been a waste of time. The hole spewed a frosty breath for several hours, and the drill crews crowded around to stick their faces in it and breathe the great gulps of the helium oxygen mixture. But then the blow subsided, and the hole leaked only a wisp of steam.

Technicians came, and lowered sonar "cameras" down to the ice. They spent a week taking internal soundings and plotting the extent of the ice-dome on their charts. They brought up samples of ice and tested them. The engineers worked late into the Martian nights.

Then it was finished. The engineers came out of their huddles and called to the foremen of the labor gangs. They led the foremen around the site, pointing here, pointing there, sketching with chalk on the foundation, explaining in solemn voices. Soon the foremen were bellowing at their crews.

"Let's get the derrick down!"

"Start that mixer going!"

"Get that steel over here!"

"Unroll that dip-wire!"

"Get a move on! Shovel that fill!"

Muscles tightened and strained, machinery clamored and rang. Voices grumbled and shouted. The operation was starting again. Without knowing why, Manue shoveled fill and stretched dip-wire and poured concrete for a big floor slab to be run across the entire hundred-yard square, broken only by the big pipe-casing that stuck up out of the ground in the center and leaked a thin trail of steam.

The drill crew moved their rig half a mile across the plain to a point specified by the geologists and began sinking another hole. A groan went up from structural boys: "Not *another* one of these things!"

But the supervisory staff said, "No, don't worry about it."

There was much speculation about the purpose of the whole operation, and the men resented the quiet secrecy connected with the project. There could be no excuse for secrecy, they felt, in time of peace. There was a certain arbitrariness about it, a hint that the Commission thought of its employees as children, or enemies, or servants. But the supervisory staff shrugged off all questions with: "You know there's tritium ice down there. You know it's what we've been looking for. Why? Well—what's the difference? There are lots of uses for it. Maybe we'll use it for one thing, maybe for something else. Who knows?"

Such a reply might have been satis-

factory for an iron mine or an oil well or a stone quarry, but tritium suggested hydrogen-fusion. And no transportation facilities were being installed to haul the stuff away—no pipelines nor railroad tracks nor glider ports.

Manue quit thinking about it. Slowly he came to adopt a grim cynicism toward the tediousness, the back-breaking labor of his daily work; he lived from day to day like an animal, dreaming only of a return to Earth when his contract was up. But the dream was painful because it was distant, as contrasted with the immediacies of Mars: the threat of atrophy; coupled with the discomforts of continued breathing, the nightmares, the barrenness of the landscape, the intense cold, the harshness of men's tempers, the hardship of labor, and the lack of a cause.

A warm, sunny Earth was still over four years distant, and tomorrow would be another back-breaking, throat-parching, heart-tormenting, chest-hurting day. Where was there even a little pleasure in it? It was so easy, at least, to leave the oxy turned up at night, and get a pleasant restful sleep. Sleep was the only recourse from harshness, and fear robbed sleep of its quiet sensuality—unless a man just surrendered and quit worrying about his lungs.

Manue decided that it would be safe to give himself two completely restful nights a week.

Concrete was run over the great square and troweled to a rough finish. A glider train from the Mare Ery-

thraeum brought in several huge crates of machinery, cut-stone masonry for building a wall, a shipful of new personnel, and a real rarity: lumber, cut from the first Earth-trees to be grown on Mars.

A building began going up, with the concrete square for foundation and floor. Structures could be flimsier on Mars; because of the light gravity, compression-stresses were smaller. Hence, the work progressed rapidly, and as the flat-roofed structure was completed, the technicians began uncrating new machinery and moving it into the building. Manue noticed that several of the units were computers. There was also a small steam-turbine generator driven by an atomic-fired boiler.

Months passed. The building grew into an integrated mass of power and control systems. Instead of using the well for pumping, the technicians were apparently going to lower something into it. A bomb-shaped cylinder was slung vertically over the hole. The men guided it into the mouth of the pipe casing, then let it down slowly from a massive cable. The cylinder's butt was a multi-contact socket like the female receptacle for a hundred-pin electron tube. Hours passed while the cylinder slipped slowly down beneath the hide of Mars. When it was done, the men hauled out the cable and began lowering stiff sections of pre-wired conduit, fitted with a receptacle at one end and a male plug at

the other, so that as the sections fell into place, a continuous bundle of control cables was built up from "bomb" to surface.

Several weeks were spent in connecting circuits, setting up the computers, and making careful tests. The drillers had finished the second well hole, half a mile from the first, and Manue noticed that while the testing was going on, the engineers sometimes stood atop the building and stared anxiously toward the steel skeleton in the distance. Once while the tests were being conducted, the second hole began squirting a jet of steam high in the thin air, and a frantic voice bellowed from the roof top.

"Cut it! Shut it off! Sound the danger whistle!"

The jet of steam began to shriek a low-pitched whine across the Martian desert. It blended with the rising and falling *OOOO-awwww* of the danger siren. But gradually it subsided as the men in the control station shut down the machinery. All hands came up cursing from their hiding places, and the engineers stalked out to the new hole carrying Geiger counters. They came back wearing pleased grins.

The work was nearly finished. The men began crating up the excavating machinery and the drill rig and the tools. The control-building devices were entirely automatic, and the camp would be deserted when the station began operation. The men were dis-

grunted. They had spent a year of hard labor on what they had thought to be a tritium well, but now that it was done, there were no facilities for pumping the stuff or hauling it away. In fact, they had pumped various solutions *into* the ground through the second hole, and the control station shaft was fitted with pipes that led from lead-lined tanks down into the earth.

Manue had stopped trying to keep his oxy properly adjusted at night. Turned up to a comfortable level, it was like a drug, insuring comfortable sleep—and like addict or alcoholic, he could no longer endure living without it. Sleep was too precious, his only comfort. Every morning he awoke with a still, motionless chest, felt frightening remorse, sat up gasping, choking, sucking at the thin air with whining rattling lungs that had been idle too long. Sometimes he coughed violently, and bled a little. And then for a night or two he would correctly adjust the oxy, only to wake up screaming and suffocating. He felt hope sliding grimly away.

He sought out Sam Donnell, explained the situation, and begged the troffie for helpful advice. But the mech-repairman neither helped nor consoled nor joked about it. He only bit his lip, muttered something non-committal, and found an excuse to hurry away. It was then that Manue knew his hope was gone. Tissue was withering, tubercules forming, tubes growing closed. He knelt abjectly be-

side his cot, hung his face in his hands, and cursed softly, for there was no other way to pray an unanswerable prayer.

A glider train came in from the north to haul away the disassembled tools. The men lounged around the barracks or wandered across the Martian desert, gathering strange bits of rock and fossils, searching idly for a glint of metal or crystal in the wan sunshine of early fall. The lichens were growing brown and yellow, and the landscape took on the hues of Earth's autumn if not the forms.

There was a sense of expectancy around the camp. It could be felt in the nervous laughter, and the easy voices, talking suddenly of Earth and old friends and the smell of food in a farm kitchen, and old half-forgotten tastes for which men hungered: ham searing in the skillet, a cup of frothing cider from a fermenting crock, iced melon with honey and a bit of lemon, onion gravy on homemade bread. But someone always remarked, "What's the matter with you guys? We ain't going home. Not by a long shot. We're going to another place just like this."

And the group would break up and wander away, eyes tired, eyes haunted with nostalgia.

"What're we waiting for?" men shouted at the supervisory staff. "Get some transportation in here. Let's get rolling."

Men watched the skies for glider

trains or jet transports, but the skies remained empty, and the staff remained close-mouthed. Then a dust column appeared on the horizon to the north, and a day later a convoy of tractor-trucks pulled into camp.

"Start loading aboard, men!" was the crisp command.

Surly voices: "You mean we don't go by air? We gotta ride those kidney-bouncers? It'll take a week to get to Mare Ery! Our contract says—"

"Load aboard! We're not going to Mare Ery yet!"

Grumbling, they loaded their baggage and their weary bodies into the trucks, and the trucks thundered and clattered across the desert, rolling toward the mountains.

The convoy rolled for three days toward the mountains, stopping at night to make camp, and driving on at sunrise. When they reached the first slopes of the foothills, the convoy stopped again. The deserted encampment lay a hundred and fifty miles behind. The going had been slow over the roadless desert.

"Everybody out!" barked the messenger from the lead truck. "Bail out! Assemble at the foot of the hill."

Voices were growling among themselves as the men moved in small groups from the trucks and collected in a milling tide in a shallow basin, overlooked by a low cliff and a hill. Manue saw the staff climb out of a cab and slowly work their way up the

cliff. They carried a portable public address system.

"Gonna get a preaching," somebody snarled.

"Sit down, please!" barked the loud-speaker. "You men sit down there! Quiet—quiet, please!"

The gathering fell into a sulky silence. Will Kinley stood looking out over them, his eyes nervous, his hand holding the mike close to his mouth so that they could hear his weak troffie voice.

"If you men have questions," he said, "I'll answer them now. Do you want to know what you've been doing during the past year?"

An affirmative rumble arose from the group.

"You've been helping to give Mars a breathable atmosphere." He glanced briefly at his watch, then looked back at his audience. "In fifty minutes, a controlled chain reaction will start in the tritium ice. The computers will time it and try to control it. Helium and oxygen will come blasting up out of the second hole."

A rumble of disbelief arose from his audience. Someone shouted: "How can you get air to blanket a planet from one hole?"

"You can't," Kinley replied crisply. "A dozen others are going in, just like that one. We plan three hundred, and we've already located the ice pockets. Three hundred wells, working for eight centuries, can get the job done."

"Eight centuries! What good—"

"Wait!" Kinley barked. "In the meantime, we'll build pressurized cities close to the wells. If everything pans out, we'll get a lot of colonists here, and gradually condition them to live in a seven or eight psi atmosphere—which is about the best we can hope to get. Colonists from the Andes and the Himalayas—they wouldn't need much conditioning."

"What about us?"

There was a long plaintive silence. Kinley's eyes scanned the group sadly, and wandered toward the Martian horizon, gold and brown in the late afternoon. "Nothing—about us," he muttered quietly.

"Why did we come out here?"

"Because there's danger of the reaction getting out of hand. We can't tell anyone about it, or we'd start a panic." He looked at the group sadly. "I'm telling you now, because there's nothing you could do. In thirty minutes—"

There were angry murmurs in the crowd. "You mean there may be an explosion?"

"There *will* be a limited explosion. And there's very little danger of anything more. The worst danger is in having ugly rumors start in the cities. Some fool with a slip-stick would hear about it, and calculate what would happen to Mars if five cubic miles of tritium ice detonated in one split second. It would probably start a riot. That's why we've kept it a secret."

The buzz of voices was like a disturbed beehive. Manue Nanti sat in the midst of it, saying nothing, wearing a dazed and weary face, thoughts jumbled, soul drained of feeling.

Why should men lose their lungs that after eight centuries of tomorrows, other men might breathe the air of Mars as the air of Earth?

Other men around him echoed his thoughts in jealous mutterings. They had been helping to make a world in which they would never live.

An enraged scream arose near where Manue sat. "They're going to blow us up! They're going to blow up Mars."

"Don't be a fool!" Kinley snapped.

"Fools they call us! We *are* fools! For ever coming here! We got sucked in! Look at *me*!" A pale dark-haired man came wildly to his feet and tapped his chest. "Look! I'm losing my lungs! We're all losing our lungs! Now they take a chance on killing everybody."

"Including ourselves," Kinley called coldly.

"We oughta take him apart. We oughta kill every one who knew about it—and Kinley's a good place to start!"

The rumble of voices rose higher, calling both agreement and dissent. Some of Kinley's staff were looking nervously toward the trucks. They were unarmed.

"You men sit down!" Kinley barked.

Rebellious eyes glared at the supervisor. Several men who had come to their feet dropped to their haunches

again. Kinley glowered at the pale upriser who called for his scalp.

"Sit down, Handell!"

Handell turned his back on the supervisor and called out to the others. "Don't be a bunch of cowards! Don't let him bully you!"

"You men sitting around Handell. Pull him down."

There was no response. The men, including Manue, stared up at the wild-eyed Handell gloomily, but made no move to quiet him. A pair of burly foremen started through the gathering from its outskirts.

"Stop!" Kinley ordered. "Turpin, Schultz—get back. Let the men handle this themselves."

Half a dozen others had joined the rebellious Handell. They were speaking in low tense tones among themselves.

"For the last time, men! Sit down!"

The group turned and started grimly toward the cliff. Without reasoning why, Manue slid to his feet quietly as Handell came near him. "Come on, fellow, let's get him," the leader muttered.

The Peruvian's fist chopped a short stroke to Handell's jaw, and the dull *thuk* echoed across the clearing. The man crumpled, and Manue crouched over him like a hissing panther. "Get back!" he snapped at the others. "Or I'll jerk his hoses out."

One of the others cursed him.

"Want to fight, fellow?" the Peruvian wheezed. "I can jerk several

hoses out before you drop me!"

They shuffled nervously for a moment.

"The guy's crazy!" one complained in a high voice.

"Get back or he'll kill Handell!"

They sidled away, moved aimlessly in the crowd, then sat down to escape attention. Manue sat beside the fallen man and gazed at the thinly smiling Kinley.

"Thank you, son. There's a fool in every crowd." He looked at his watch again. "Just a few minutes men. Then you'll feel the Earth-tremor, and the explosion, and the wind. You can be proud of that wind, men. It's new air for Mars, and you made it."

"But we can't breathe it!" hissed a troffie.

Kinley was silent for a long time, as if listening to the distance. "What man ever made his own salvation?" he murmured.

They packed up the public address amplifier and came down the hill to sit in the cab of a truck, waiting.

It came as an orange glow in the south, and the glow was quickly shrouded by an expanding white cloud. Then, minutes later the ground pulsed beneath them, quivered and shook. The quake subsided, but remained as a hint of vibration. Then after a long time, they heard the dull-throated roar thundering across the Martian desert. The roar continued steadily, grumbling and growling as it

would do for several hundred years.

There was only a hushed murmur of awed voices from the crowd. When the wind came, some of them stood up and moved quietly back to the trucks, for now they could go back to a city for reassignment. There were other tasks to accomplish before their contracts were done.

But Manue Nanti still sat on the ground, his head sunk low, desperately trying to gasp a little of the wind he had made, the wind out of the ground, the wind of the future. But lungs were clogged, and he could not drink of the racing wind. His big calloused hand clutched slowly at the ground, and he choked a brief sound like a sob.

A shadow fell over him. It was Kinley, come to offer his thanks for the quelling of Handell. But he said nothing for a moment as he watched Manue's desperate Gethsemane.

"Some sow, others reap," he said.

"Why?" the Peruvian choked.

The supervisor shrugged. "What's the difference? But if you can't be both, which would you rather be?"

Nanti looked up into the wind. He imagined a city to the south, a city built on tear-soaked ground, filled with people who had no ends beyond their culture, no goal but within their own society. It was a good sensible

question: Which would he rather be—sower or reaper?

Pride brought him slowly to his feet, and he eyed Kinley questioningly. The supervisor touched his shoulder.

"Go on to the trucks."

Nanti nodded and shuffled away. He had wanted something to work for, hadn't he? Something more than the reasons Donnell had given. Well, he could smell a reason, even if he couldn't breathe it.

Eight hundred years was a long time, but then—long time, big reason. The air smelled good, even with its clouds of boiling dust.

He knew now what Mars was—not a ten-thousand-a-year job, not a garbage can for surplus production. But an eight-century passion of human faith in the destiny of the race of Man.

He paused short of the truck. He had wanted to travel, to see the sights of Earth, the handiwork of Nature and of history, the glorious places of his planet.

He stooped, and scooped up a handful of the red-brown soil, letting it sift slowly between his fingers. Here was Mars—his planet now. No more of Earth, not for Manue Nanti. He adjusted his aerator more comfortably and climbed into the waiting truck.

THE END



NIGHTMARE BROTHER

BY ALAN E. NOURSE

The ultimate test of a man, actually, is the test of whether or not he has the strength, courage, and sheer guts to face and overcome the toughest of all opponents—his own ideas!

He was walking down a tunnel.

At first it didn't even occur to him to wonder *why* he was walking down the tunnel, nor how he had got there, nor just what tunnel it was. He was walking quickly, with short, even steps, and it seemed, suddenly, as if he had been walking for hours.

It wasn't the darkness that bothered him at first. The tunnel wasn't bright, but it was quite light enough, for the walls glowed faintly with a bluish luminescence. Ahead of him the glowing walls stretched as far as he could see. The tunnel was about ten feet wide, and ten feet high, with smooth walls arching into a perfectly smooth curve over his head. Under his feet the floor seemed cushiony,



yielding slightly to the pressure as he walked, and giving off a soft, muffled sound in perfect measure to his tread. It was a pleasant, soothing sound, and he hardly thought to wonder at all just what he was doing. It was quite obvious, after all. As simple as simple could be. He was walking down a tunnel.

But then little tendrils of caution and question crept into his mind, and a puzzled frown crossed his quiet face. He stopped abruptly, standing stock-still in the tunnel as he squinted at the glowing walls in growing confusion. What a very odd place to be, he thought. A tunnel! He glanced about him, and cocked his head, listening for a long moment, until the stark si-

lence of the place chilled him, forced him to sniff audibly, and scratch his head, and turn around.

My name is Robert Cox, he thought, and I am walking down a tunnel. He pondered for a moment, trying to remember. How long had he been walking? An hour? He shook his head. It must have been longer than that. Oddly, he couldn't remember *when* he had started walking. How had he got here? What had he been doing before he came into the tunnel? A chill of alarm crept up his spine as his mind groped. What had happened to his memory? Little doors in his mind seemed to snap quickly shut even as his memory approached them. Ridiculous, he thought, to be walking down

a tunnel without even knowing where it was leading—

He peered forward in the silence. Quite suddenly he realized that he was absolutely alone. There was not a sound around him, not a stir, no sign of another human being, not even a flicker of life of any kind. The chill deepened, and he walked cautiously over to one wall, tapped it with his knuckles. Only a dull knock. For the merest fraction of a second an alarm rang in his mind, a cold, sharp intimation of deadly danger. He chuckled, uneasily. There was really no reason to be alarmed. A tunnel had to have an end, somewhere.

And then he heard the sound, and stared wide-eyed down the tunnel. It came to his ears very faintly, at first, the most curious sort of airy whistling, like a shrill pipe in the distance. It cut through the stillness cleanly, like a razor, leaving a strange tingle of dread in his mind. He listened, hardly breathing. Was the light growing fainter? Or were his eyes not behaving? He blinked, and sensed the light dimming even as the whistling sound grew louder and nearer, mingling with another, deeper sound. A throbbing roar came to his ears, overpowering the shrillness of the whistle, and then he saw the light, far down the tunnel, a single, round, yellow light, directly in the center of the passage, growing larger and larger as the roar intensified. A sharp wind suddenly stirred his dark hair as he stared

fascinated by the yellow light bearing down on him. In a horrible flash, an image crossed his mind—the image of a man trapped on a railroad track as a dark engine approached with whistle screaming, bearing down like some hideous monster out of the night.

A cry broke from the man's lips. *It was a train!* Roaring down the tunnel toward him, it was moving like a demon, with no tracks, screeching its warning as it came, with the light growing brighter and brighter, blinding him. Relentlessly it came, filling the entire tunnel from side to side, hissing smoke and fire and steam from its valves, its whistle shrieking—

With a scream of sheer terror, Cox threw himself face down on the floor, trying frantically to burrow deeper into the soft matt of the tunnel floor, closing his mind down, blanking out everything but horrible, blinding fear. The light blazed to floodlight brilliance, and with a fearful rush of wind the roar rose to a sudden thundering bellow over his head. Then it gave way to the loud, metallic *clak-clak-clak* of steel wheels on steel rails beside his ears, and faded slowly into the distance behind him.

Trembling uncontrollably in every muscle, Cox stirred, trying to rise to his knees, groping for control of his mind. His eyes were closed tightly, and suddenly the floor was no longer soft matting, but a gritty stuff that seemed to run through his fingers.

He opened his eyes with a start,

and a little cry came to his lips. The tunnel was gone. He was standing ankle-deep in the steaming sand of a vast, yellow desert, with a brassy sun beating down from a purple sky. He blinked, unbelieving, at the yellow dunes, and a twisted Joshua tree blinked back at him not ten feet away.

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Two men and a girl stood in the room, watching the motionless body of the dark-haired man sprawled on the bed. The late afternoon sun came in the window, throwing bright yellow panels across the white bedspread, but the man lay quite still, his pale eyes wide open and glassy, oblivious to anything in the room. His face was deathly pale.

The girl gasped. "I think he's stopped breathing," she whispered.

The taller of the men, dressed in white, took her by the shoulder, gently turning her face away. "He's still breathing," he reassured her. "You shouldn't be here, Mary. You should go home, try to get some rest. He'll be all right."

The other man snorted, his pink face flushed with anger. "He shouldn't be here either," he hissed, jerking a thumb at the man on the bed. "I tell you, Paul, Robert Cox is not the man. I don't care what you say. He'll never get through."

Dr. Paul Schiml drew a deep breath, turning to face the other. "If Cox can't get through, there isn't a man in

the Hoffman Medical Center who can—or ever will. You know that."

"I know that there were fifty others in the same training program who were better fitted for this than Bob Cox!"

"That's not true." Dr. Schiml's voice was sharp in the still room. "Reaction time, ingenuity, opportunism—not one in the group could hold a candle to Bob." He stared down at the red-faced man, his eyes glittering angrily. "Admit it, Connover. You're not worried for Bob Cox's sake. You're worried for your own neck. You've been afraid since the start, since the first ships came back to Earth, because you've been in charge of a program you don't believe in, and you're afraid of what will happen if Bob Cox doesn't come through. It wouldn't matter who was on that bed—you'd still be afraid." He sniffed in disgust. "Well, you needn't worry. Bob Cox will do it, if anyone can. He *has* to."

"And if he *doesn't* get through?"

The tall doctor stared angrily for a moment, then turned abruptly and walked over to the bedside. There was hardly a flicker of life in the man who lay there, only the shallowest respiration to indicate that he *was* alive. With gentle fingers Dr. Schiml inspected the small incision in the man's skull, checked again the multitude of tiny, glittering wires leading to the light panel by the bedside. He stopped, staring at the panel, and motioned sharply to Connover. "Here's the first, already," he whispered.

For a moment, only the faintest buzz of sound could be heard from the panel; then Connover let out a soft whistle. "A tunnel. That makes sense. But what a device—" He turned wide-eyed to Schiml. "He could kill himself!"

"Of course he could. We've known that from the start."

"But *he* doesn't know—"

"He doesn't know anything." Schiml pointed to the panel. "A train Ingenious? It's amazing. Could you think of anything worse?" He watched for a moment. "No room on either side for escape—he'll go under it."

All three watched, hardly breathing. Suddenly the girl was sobbing uncontrollably, burying her face on the doctor's shoulder. "It's horrible," she choked. "It's horrible . . . he'll never make it, never, he'll be killed—"

"No, Mary, not Robert. Not after the training he's had." The doctor's voice was grim. "You've got to believe that, Mary. This is the test, the final test. He can't let us down, not now—"



He could feel danger all about him. It was nothing at all tangible, just a deep, hollow voice in his mind, screaming out the danger. Cox shuddered, and glanced up at the brassy yellow sun, his forehead wet with perspiration. It was hot! Steaming hot, with an unrelenting heat that seemed to melt him down inside like soft wax.

Every muscle in his body was tense; he stood poised, tingling, his pale eyes searching the barren yellow dunes of sand for the danger he knew was there—

Then the Joshua tree moved.

With a gasp, he threw himself on the sand, ten feet from it, watching it wide-eyed. Just a slight movement of the twisted arms of the thing—he could have been mistaken, his mind could have played tricks. He trembled as he squinted through the shimmering heat at the gaunt, twisted tree.

And then, quite suddenly, realization struck him. Desert! He had been in a *tunnel*—yes, that was right, a tunnel, and that light, that roaring thing—*what was he doing here?* He sat up slowly in the sand, ran his fingers through the hot grains, studying them with infinite curiosity. No doubt about it—it *was* desert! But how? How had he reached the tunnel in the first place? And what in the rational universe could have transported him to *this* place?

Eagerly his mind searched, striking against the curious, shadowy shield that blocked his memory. There was an answer, he knew; something was wrong, he shouldn't be there. Deep in his mind he knew he was in terrible danger, but such *idiotic* danger—if he could only think, somehow remember—

His shoulders tensed, and he froze, reactively, his eyes on the yellow mound of sand across the ridge from

him. Hardly breathing, he watched, his mind screaming *danger, danger*, his eyes focusing on the yellow hillock. Then it moved again, swiftly, in the blinking of an eye, and froze again, ten feet closer—

It had looked in that fraction of a second, remarkably like a *cat*—a huge, savage, yellow cat. And then it had frozen into a hillock of sand.

Swiftly Cox moved, on hands and knees, at angles across the slope of sand from the thing. The sand burned his hands, and he almost cried out as the grit swirled up into his eyes, but he watched, every muscle tense. It moved again, at a tangent, swiftly sliding down the slope parallel to his movement, a huge, yellow, fanged thing, moving with the grace and flowing speed of molten gold, little red eyes fixed on him. Then it froze again, melting into the yellow, shimmering sand.

Stalking him!

In blind panic he pulled himself to his feet and ran down the sandy slope away from it, his eyes burning, running with the devil at his heels until a dune lay between him and the creature. Then he threw himself flat on the sand, peering over the rim of the dune. There was a swift blur of yellow movement, and the sand-cat was on the slope behind him, twenty yards closer, crouching against the sand, panting hungrily. Frantically, Cox glanced around him. Nothing! Nothing but yellow, undulating sand

hills, the scorching sun, and the tall, twisted Joshua trees that moved! He looked back suddenly, and saw the sand-cat creeping toward him, slowly, slowly, not thirty yards away.

His breath came in panting gasps as he watched the creature. It was eight feet long, with lean, muscular haunches that quivered in the sun, the red eyes gleaming in savage hate. It moved with a sure confidence, a relentless certainty of its kill. Cox tried to think, tried to clear his mind of the fear and panic that gnawed at him, tried to clear away the screaming, incredulous puzzlement that tormented him. He had to get away, but he couldn't run. The creature was too fast. He knew his presence there was incredible; something in his mind tried to tell him not to believe it, that it wasn't true—but he felt the gritty sand under his sweating palms, and it was very, very real. And the sand-cat moved closer—

In a burst of speed he ran zigzagging down the slope and up the next, watching over his shoulder for the flash of yellow movement. With each change in direction, the sand-cat also shifted, stalking faithfully. If only he could get out of its sight for a moment! If it wasn't too bright, if that savage brain were starved enough, he might force it into a pattern response— He ran ten feet to the right, paused, and rushed on ten feet to the left, heading toward the huge boulder which stood up like a naked sentinel on the dune

ahead. The sand-cat followed, moving to the right, then to the left. Again Cox sped, sure now that the pattern would be followed, moving right, then left. A long run away from the rock, then a long run toward it. The cat was closer, just twenty yards away, closing the distance between them with each run. Panting, Cox tried to catch his breath, taking a steel grip on his nerves. He knew that panic could kill him. Swiftly, he scuttled up over the edge of the dune, far to the right of the boulder, then abruptly switched back, keeping the boulder between him and the cat, reaching it, peering cautiously around—

Warm excitement flooded his mind. Slowly, ever so slowly the sand-cat was edging up over the dune, peering down in the direction he had run, slipping up over the dune on its belly, freezing, peering, a savage, baffled snarl coming from its dripping mouth. Eagerly Cox searched the sand around the boulder, picked up a chunk of sandstone as big as a brick. Then he took a huge breath, and plunged from behind the boulder, toward the cat, moving silently in the soft, hot sand. With a mixture of fury and fear he fell on the beast, raising the stone, bringing it down with all his might on the flat yellow head. The sand-cat snarled and whirled, claws slashing the air; his hot, rank breath caught Cox full, gagging him as he raised the stone again and again, bringing it down on the creature's skull. Razor

claws ripped at his side, until the cat screamed and convulsed, and lay twitching—

And suddenly there was darkness, and a cold winter breeze in his face, and the stars were twinkling in the frigid night air above him. The sand-cat was gone, the desert, the Joshua trees. He lay in a ditch, half-soaked in icy mud, and his side was bleeding angrily.

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He stared around him, and shivered. He was at the bottom of a ditch, his body lying in an icy rivulet of water. Above him, he could see the embankment, topped by a small iron fence. A road! Painfully he dragged himself up toward the top, peered over. The strip of polished metal gleamed in the starlight, as icy gusts of wind and snow swept down to bite his ears and bring tears to his eyes. The tears froze on his eyelids, and the sharp coldness of the dark air bit into his lungs, bringing pain with every breath.

In the distance he heard a rumbling sound, felt the road tremble as the gargantuan vehicles approached. Instinctively Cox ducked below the road surface, froze immobile as the long line of grotesque metallic monsters roared by, glimmering within their dull fluorescent force-shields. They showed no sign of life, but rumbled past him, moving steadily down the glittering highway. He could see the

curious turrets, the gunlike projections, stark against the bleak night sky. Weapons, he thought, huge, tanklike engines which lumbered and roared along the road on some errand of death. Suddenly the last of the convoy lumbered past, and he eased himself cautiously up onto the road. A burst of thunder roared in his ears, and abruptly it began to pour, huge icy drops that splattered with the force of machine-gun bullets, stinging his skin and soaking his hair and clothes. He shuddered, miserably, his mind groping in confusion. If he could only find a place to *think*, somewhere to rest and collect himself, somewhere to try to dress the wound in his side. In the gloom across the road he thought he could make out the gaunt ruins of a building standing against the starlight, and with infinite pain and slowness he dragged himself across the frigid steel strip, and down into the ditch on the other side. His feet were growing numb, and the pain in his side had turned to a dull, angry throbbing, but he somehow stumbled and staggered across the field, every ounce of his strength focused on reaching some sort of shelter.

It was a building—or it had been, once. Two walls had been completely shattered, bombed out, and the roof had fallen in, but one intact wall stood like a gaunt sentinel in the darkness. Inside, the building had been gutted by fire, and Cox was forced to rip

ruddle and debris away from the door. He forced it open on squeaking, long-neglected hinges. Finally he found a corner that was dry, and located a bit of blanket from the rubble inside. He sank into the corner, shaking his head, trying desperately to orient himself.

His side had stopped bleeding. A quick examination revealed four shallow, ugly-looking lacerations running down to his thigh. Four claws—the cat! Of course, the sand-cat had clawed him in its last, desperate snarl of rage. Cox leaned back, scratching his black hair with a grimy finger. The sand-cat was in the *desert*, not *here*. But before that, it was a tunnel, with a roaring train bearing down on him, a train that moved without tracks. And now, a frigid, war-beaten world—

It didn't add up. Desperately he tried to remember what had happened in between. Nothing, it seemed. He had slipped from one to the other in the blinking of an eye. But that was impossible! You just couldn't shift like that, from one place to another. At least—he didn't *think* it was possible.

He heard his breath, short and shallow, echoing in the silence of the ruined building. He was here. This building was real, the icy coldness and the darkness were very real. But the wound in his side, was real, too. That hadn't happened here, that had happened somewhere else. How had he



come here? Had he *wanted* to come? He shook his head angrily. It was ridiculous. But three different places—there *had* to be something in common, some common denominator. What had he found in all three places that was the same, what possible connection was there?

Danger! He sat bolt upright, staring

into the blackness. That was it! A tunnel, and danger. A desert, and danger. Now this cold, hostile place, *and danger!* Not danger to anyone else, just danger to himself. *Pure, raw, naked danger.*

He pondered for a while, his mind whirling. Somehow, it seemed that danger had been his entire life, that all he could think of, the only thing he had ever known was danger. Could that be true? Instinctively, he knew

it wasn't. There *had* been peace, before, somewhere, and love, and happy hours. But superimposed in his mind was the acute, barren awareness of imminent death, a sure knowledge that he could die here, abruptly, at any moment, and only his own resourcefulness could save him.

It was like repeating the well-rehearsed words of a play. Somebody had told him that. It wasn't original in his own mind. It was propaganda, conditioned information, something he had been *taught!*

Could Mary have told him?

He gasped. Mary! He repeated the name over and over, excitedly. There was the link. Mary, his wife—certainly there had been peace, and warmth, and comfort, and love. Mary was his wife, he had known those things with her, in some remote corner of his memory. He felt himself glow as he suddenly remembered Mary's lovely face, the depth of love in those dark eyes, the warmth of her arms around him, the consuming peace and contentment in her sweet kisses and soft, happy murmurings—somewhere there had been Mary, who loved him beyond anything in the world.

The wind stirred through the ruined building, bringing a sifting of damp snow into his face. There was no Mary here. Somehow, he was here, and he was in danger, and there was no warmth nor love here. His mind swept back to reality with a jolt. He hadn't

wanted to come here. It *couldn't* have been his will. There was only one other possible answer. *He had been put here.*

His mind struck the idea, and trembled. Like the fit of a hand in a glove, the thought settled down in his mind, filling a tremendous gap. Yes, that was it, he had been placed here, for some reason. He wasn't willfully changing from place to place, he was *being changed* from place to place, against his will and volition. From danger into danger, he was being shifted, like a chessman in some horrible game of death. But no one was touching him, no one was near him—how could these changes be happening? The answer sent a chill through him, and his hand trembled. It was obvious. The changes were happening in his own mind.

He rubbed his stubbled chin. If this were true, then these things weren't really happening. He hadn't actually been in the tunnel. There hadn't actually been a sand-cat. He wasn't really lying here in a cold, damp corner, with deadly frost creeping up his legs. Angrily he rejected the thought. There was no room for doubt, these things were real, all right. The slashes on his side were real. He knew, beyond shadow of a doubt, that there *had* been a sand-cat. He knew it would have killed him if it could have, and if it had, he would have been quite dead.

You can die, and only your own re-

sourcefulness will save you—who had said that? There had been a program, training him, somewhere, for something—something vastly important. His mind groped through the darkness, trying to penetrate the fuzzy uncertainty of his memory. Those words—from a small, red-faced man, and a tall, gaunt man in white—*Schiml!* Schiml had said those words, Schiml had put him here!

Suddenly he thought he saw the whole thing clearly. He was in danger, he must overcome the danger, he wasn't supposed to know that it wasn't really happening! There had been a long training program, with Connover, and Schiml, and all the rest, and now he was on his own. But nothing, *nothing* could really hurt him, because these things were only figments of his imagination.

He shivered in the coldness. Somehow, he didn't quite dare to believe that.



Dr. Schiml sat down on the chair and wiped drops of perspiration from his brow. His eyes were bright with excitement as he glanced at the pallid form on the bed, and then back at the red-faced Connover. "He's taken the first step," he said hoarsely. "I was sure he would."

Connover scowled and nodded, his eyes fixed on the panel beside the bed. "Yes, he took the first step all right. He's figured out the source of his en-

vironment. That's not very much."

Schiml's eyes gleamed. "When we first computed the test, you wouldn't even concede the possibility of that. Now you see that he's made it. He'll make the other steps, too."

Connover whirled angrily on the doctor. "How can he? He just *doesn't have the data!* Any fool could deduct that these are subjective mental phenomena he's facing, under the circumstances. But you're asking for the impossible if you expect him to go any further along that line of reasoning. He just doesn't have enough memory of reality to work with."

"He has Mary, and you, and me," the doctor snapped. "He knows there's been a training program, and he knows that he's being tested. And now he knows that he's living in the nightmares of his own mind. He's got to solve the rest."

Connover snorted. "And that knowledge itself increases his danger a thousand times. He'll be reckless, overconfident—"

The girl stirred. She had been staring blankly at the man on the bed; her face was drawn and pallid, and her eyes were red. She looked dully at Dr. Schiml. "Connover's right," she said. "He has no way of knowing. He may just stand there and let himself—" she broke off with a choked sob.

"Mary, can't you see? That's exactly what we've got to know. We've got to know if the training was valid.

He may get reckless, true, but never *too* reckless. The cat, remember? It hurt him. It *really* hurt him. He'll take the next step, all right. He may be hurt first, but he'll take it."

The girl's face flushed angrily. "It may kill him! You're asking too much, he's not a superman, he's just an ordinary, helpless human being like anybody else. He doesn't have any magical powers."

The doctor's face was pale. "That's right. But he does have some very unmagical powers, powers we've been drumming into his mind for the past year. He'll just have to use them, that's all. He'll *have* to."

Mary's eyes shifted once again to the motionless form on the bed. "How much proof do you need?" she asked softly. "How much more will he have to take before you stop it and bring him back?"

The doctor's eyes drifted warily to Connover, then back to Mary. A little smile crept onto his lips. "Don't worry," he said gently, "I'll stop it soon enough. Just as soon as he's taken the necessary steps. But not until then."

"And if he can't make them?"

She didn't see his hand tremble as he adjusted the panel light gently. "Don't worry," he said again. "He can make them."

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Gradually the numbness crept up Robert Cox's legs. He lay on the cold,

grimy floor of the ruined building, staring into the blackness about him. His realization had brought him great relief; he was breathing more easily now, and he felt his mind relaxing from the strain he had been suffering. He knew, without question, that he was not in the midst of reality—that this cold, hostile place was *not* real, that it was merely some horrid nightmare dredged from the hidden depths of his own mind, thrust at him for some reason that he could not ponder, but thrust at him as an idiotic, horrible substitute for reality. Deep in his mind something whispered that no harm could really come. The sense of danger which pervaded his mind was false, a figment of the not-real world around him. They were testing him, it was quite obvious, though he couldn't pierce the murky shield of memory to understand why they were testing him, for what purpose. Still, having realized the unreality, the test must be ended. He couldn't be fooled any longer. He smiled to himself. Armed with that knowledge, there was no longer any danger. No real danger. Even the wound in his side was imagined, not really there—

And still the cold crept up his legs, insidiously, numbing them, moving higher and higher in his body. He didn't move. He simply waited. Because with the test all over, they would surely bring him back to reality.

Like an icy microtome blade, some-

thing slashed at his brain, swiftly, without warning. He screamed out, and his mind jerked and writhed in agony at the savage blow. He tried to sit upright, and found his muscles numb, paralyzed. Again the blow came, sharper, more in focus, striking with a horrid power that almost split his brain. He screamed again, closing his eyes tight, writhing on the floor. He tensed, steeling himself for another blow, and when it came his whole body jerked as he felt his own mental strength trying to rally like a protective barrier.

Frantically, he twisted and wriggled the upper part of his body, desperately and unthinkingly trying to stand and run, and toppled over onto his face in the rubble. Again the blow came, grating and screaming into his mind with an unrelenting savagery that baffled and appalled him. Twisting along the floor, he gained the door, peered sickly out into the blackness.

He could barely make out the gray shape of one of the steel monoliths he had seen rumbling down the road a little before. It was resting on the rocky, frozen tundra of the field, standing motionless, the glow of power surrounding it like a ghostly aurora. He knew that the attack came from there, frightening, paralyzing bolts that shook him and sent his mind reeling helplessly, an attack of undreamed-of ferocity. He struggled, trying to erect some sort of mental patchwork against the onslaught. He

had been wrong, he *could* be harmed, the test wasn't over—but why this horrible, jolting torture? Again and again the jolts came, until he screamed, and writhed, and waited in agonized anticipation of the next, and the next.

Then suddenly he felt his mind sucked down into a pool of velvet-soft warmth, of gentle sweetness, a welter of delightful tenderness. His mind wavered in sweet relief, relaxed to the throbbing, peaceful music that whirled through his mind, sinking easily into the trap—and then, abruptly, another savage blow, out of nowhere, threw him into a curled, agonized heap on the floor. *No, no, no*, his mind screamed, *don't give up, fight it*, and he fought to reinforce a barrier of protection, tried feebly to strike back at the hideous, searing blows. This isn't real, he thought to himself, this isn't really happening, this is a ridiculous, impossible nightmare, and it *couldn't possibly hurt him*—but it *was* hurting him, terribly, until he couldn't stand it, he couldn't—Another blow came, more caustic, digging sharp, taloned fingers into his brain, wrenching and twisting it beyond endurance.

He was going to die! He knew it, in a horrible flash of realization. Whatever was out there in the field was going to kill him, going to wrench him into a blubbering mass of quivering protoplasm without mind, without life—*like the men who had come back on the starship.*

He took a gasping breath. Miraculously, he felt another link in the chain fall into place. *The starship*—he had seen it, sometime so long ago. Somewhere back in a remote corner of his mind he could remember the starship which had returned, after so many years, to its home on Earth, a gaunt, beaten hulk of a ship, with the lifeless, trampled men who had started it on its voyage. Men who were alive, but barely alive, men with records of unimaginable horror on their instruments, and nothing but babbling drivel coming from their lips. Men who had gone to the stars, and met alien savagery with which they could not cope; men who had been jolted from their lethargy into naked, screaming madness at the thought of ever, ever going back—

Was *this* why he was being tested? Was this why he had been trained, subjected to this mind-wrenching, gruelling ordeal? Another searing blow struck him, scraping at the feeble strength he had left, benumbing him, driving the picture from his mind. Was *this* what those men had faced? Was it this that had destroyed them, so infinitely far from their home, so very much alone on some alien world? Or was it something else, something a hundred-fold more horrible? He reeled and screamed, as anger beat through to his consciousness, a certain awareness that, imagination or not, the danger was *real*, so horribly real that he was falling apart under the

onslaught, reaching that limit of his endurance beyond which was certain death.

Coldly, he searched for a weapon, coldly struggled to erect a shield to block the horrible blows—to fight horror with horror, to die fighting if need be. Bitterly, he closed off his mind to hate and fear, dipped into the welter of horror and hatred in his mind, something to match and conquer the monstrosity he was facing. With a howl of rage he sent out searing pictures of everything he knew of savagery, and hellish violence, and diabolical hatred and destruction, matching the alien onslaught blow for blow.

They could try to kill him, he knew they *could* kill him, and he fought them with all the strength of mental power he could drag from his brain, feeling the balance between his mind and the shrieking horror from the field rise, and sway, like a teeter-totter, back and forth, up and down, until somewhere he heard a scream, fading into silence, a scream of alien fear and hatred and defeat.

And then he sank to the floor in exhaustion, his lips moving feebly as he groaned, “I’ve got to fight them, or they’ll kill me. They’ll kill me. They’ll kill me.”

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The girl’s sobs echoed in the silent room. “Oh, stop it,” she groaned, “stop it, Paul, please—he can’t go on.

Oh, it's horrible—"

"I've had about as much as I want to watch," Connover rasped hoarsely. His face had gone very pale, and he looked ill. "How can you go on with this?"

"It's not me that's going on with it." Dr. Schiml's voice was quiet. "I'm not concocting these things. All I'm doing is applying tiny stimuli to tiny blocks of neural tissue. Nothing more. The rest comes from his own mind—"

Mary turned to him, fiercely. "How could that be true? How could there be such . . . such horror in his mind? *That* isn't Robert, you know that. Robert's kind, and fine, and gentle—how could he find such nightmares in his mind?"

"Everyone has nightmares in his mind, Mary. Even you. And everyone has the power of death in his mind."

"But he's taken all the steps we planned," Connover cried. "What more do you expect?"

"Some of the steps," Schiml corrected angrily. "Connover, do you want to throw all these months of work out the window? Of course he's come a long way. He's realized that he's in danger that *can* kill him—that was desperately important—and he realizes the reason that he's being tested, too, though he hasn't actually rationalized it out in that way. He's beginning to realize why the starships failed. And he's realizing that he really *must* fight for survival. From the evi-

dence he started with, he's gone a long way—a remarkably long way. Without the training, he wouldn't have survived the tunnel. But we can't stop now. He hasn't even approached the most vital realization of all. He's too strong, too confident, not desperate enough. I can't help him, Connover. He's got to do it himself."

"But he can't survive another attack like the last," Connover snapped. "Training or no training, no man could. You're deliberately letting him kill himself, Paul. Nobody could survive more of that—"

"He'll *have* to. The crews of the starships couldn't face what they found out there. That's why they came back—the way they did."

Connover's face was working. "Well, I wash my hands of it. I'm telling you to stop now. If that boy dies"—he glared at the tall doctor—"I won't be responsible."

"But you agreed—"

"Well, I've stopped agreeing. It's going too far."

Schiml stared at him for a long moment in disgust. Then he sighed. "If that's the way it's going to be"—he glanced helplessly at the girl—"I'll take full responsibility. But I've got to finish."

"And if he dies?"

Schiml's eyes were dull. "It's very simple," he said. "If he dies, we'll never have another chance. There'll never be another starship."

He couldn't tell how long he had been unconscious. Groggily, he raised his head, wincing as the pain stabbed through his brain, and blinked at the reflection of himself in the cold, mirror-steel wall. He stared at the reflection, startled to recognize himself. Robert Cox, his black hair muddy and caked, his face scratched in livid, grimy welts, his eyes red with strain and fatigue. With a groan, he rolled over on the polished floor, staring. Hesitantly he rubbed his side; the pain was still there, sharp under his probing fingers, and his head ached violently. But the room—

Then he knew that there had been another change. The room was perfectly enclosed, without a break, or window, or seam. It was a small, low-ceilinged room, with six sides—each side a polished mirror. The ceiling and floor also reflected his image as he struggled to his feet and sniffed the faint, sharp ozone-smell of the room. In the mirrors, a hundred Robert Coxes struggled unsteadily to their feet, blinking stupidly at him and at each other. A hundred haggard, grimy Robert Coxes, from every angle, from behind and above, reflecting and re-reflecting in the brilliant glow of the room.

And then he heard the scream. A long, piercing, agonized scream that reverberated from the walls of the room, nearly splitting his eardrums. It came again, louder, more piercing. Cox involuntarily clapped his fingers

to his ears, but the sound came through them, pounding his skull. And then he heard the grinding sound along with the scream, a heavy, pervading grate of heavy-moving machinery, grinding, clanking, squealing in his ears. The scream came again, louder, more urgent, and a maddening whir joined the grating machinery. Cox stood poised in the center of the room, waiting, wary, ready for any sort of attack, his whole body geared to meet anything that came to threaten him. Deep in his mind a weariness was growing, a smoldering anger, at himself for being a party to this constantly-altering torture, at Dr. Schiml, and Connover, and anyone else who had a hand in this. What did they want? What conceivable point could there be to these attacks, this horrible instability? Why should he be subjected to such dangers that could kill him so easily? He felt a weakness, a terrible feeling that he couldn't go on, that he would have to lie down on the floor and be killed, that his limit was approaching, as he stood poised, fists clenched, waiting. How much could a man stand? What were they getting at, what did they want of him? And beyond all else, *when were they going to stop it?*

The thought broke off abruptly as a creeping chill slid up his spine, and he stared at the mirror opposite his face, almost gagging. He blinked at the image, then pawed at himself, unbelieving. Something was happen-

ing to him. Somehow, he wasn't the same any more—

Another scream cut through the air, a harsh, horrible whine of pain and torture, sending chills up his back as he winced. The image of him was different, somehow, melting and twisting before his eyes as he watched. Fascinated, he saw his hand melting away, twisting and turning into a tentacled slimy mess of writhing worms. He tore his eyes from the image, and glanced down at the hand—and a scream tore from his own throat. His cry echoed and re-echoed, as if every mirror image was screaming too, mocking him. No, he thought, *no*—it can't be happening, it *can't!* The room rumbled about him, with the cracking, grating sound of machinery with sand in its gears, and the screams pierced out again and again. Now the arm was changing, too, twisting like something independently alive—

He had to get out of that room! With a scream of helpless rage he threw himself against the mirror, heard it give a strained twang as he bounced back in a heap on the floor. His mind raced, seeking a way out; his eyes peered about, searching for a door, but there was nothing but mirrors, mirrors doing hideous things to his arm, creeping toward his shoulder. Every time he looked for a door in one wall, he could see nothing but the reflection of another wall, and another. Down on his hands and knees, he crept about the room—four, five, six walls—was it

seven and eight? Or was he repeating? He couldn't tell. Every glance drew his eyes back to the horrible, changing arm, until with superhuman control he reached down, seized the writhing thing with his good hand, and wrenched it away, a twisting, quivering, jellylike mass. And the stump continued to melt and change, and he couldn't see anything but the mirror.

A thought slid through his mind, and he caught it, frantically, a straw in the wind. Reflection. He couldn't see anything but the reflection. How many walls? He couldn't count. He couldn't be sure. But he had to get out of that room, he *had* to get out! He closed his eyes, closing out some of the brilliant light, bringing the piercing screams still closer to his mind. Slowly, painfully, he backed up to the wall of the room, keeping his eyes tightly closed, refusing to follow his actions in the mirrors, groping behind him with his good arm, seeking over the smooth surface—

A crack. Follow it. Smoothness—then metal. A knob! With a cry that was half a sob of relief he twisted the knob, felt the wall give, slipped outside onto rough, uneven ground with his eyes still closed, and slammed the door behind him. He stood panting as the grinding and the screams peeled away like a cloak, leaving him in absolute, almost palpable silence.

There was light. He opened his eyes, then closed them again with a swift

grasp, his mind rocking with shock and fear. Cautiously he opened them a slit, peering down, fighting back the terrible, age-old fear, and then slammed them shut again in a rush of vertigo.

He was standing on the top of a thousand-foot pinnacle!

Instantly he fell down flat, gripping the smooth edges of rock with a desperate grip. The section of flat rock on which he stood was the size of a coffin, six feet long and three wide. Above him was a cool, blue sky with fleecy white clouds. But on all sides, inches from where he stood, was a sheer, cruel, breathtaking drop to the pounding sea below.

A shadow passed over him, and he glanced up, tense, fearful. High above he saw huge black wings, a long, naked red neck, cruel talons, black and shiny, and a hooked beak that glinted in the sunlight. A bird like he had never seen before, sweeping down toward him, then away, making huge circles in the bright blue sky. A bird far larger than he, with evil little button-eyes that stared down at him,



unblinking—he sobbed, clinging for dear life to the rock, watching the bird circling lower and lower. Why? Why didn't they stop this torture? Why didn't they stop it, bring him back?

He sensed that the end was near—his strength was failing, his will was failing. Little streamers of hopelessness and despair were nibbling at his brain, despair in holding out much longer, despair that was almost overpowering the fear of death which had sustained him so long. The bird was so low he could hear the hungry flap of its wings as the steel-tipped talons scraped nearer and nearer to his shoulders. He peered over the edge of the precipice, seeking some kind of descent, some toe hold, finding none. He *had* to get down, he could never fight the creature. He blinked down at the blue water so far below. To climb down would be imbecility. He could feel the shredded end of his arm, loose in the cloth of his sleeve. With only one arm to hold on with, he couldn't hope to fight off the bird, even if there were a way to climb down.

A steely talon ripped his shirt as the bird skimmed by, sending a stab of pain through him, crystallizing his mad idea into action. Such a sheer drop above the water *could* mean a sheer drop below its level. An impossible choice, but there was nothing else to do. Taking a gasp of air he edged to the rim of the drop, gathered his strength, and threw himself off

into space—and pure hope.

The water struck with a horrible impact, driving the wind from him, but he fought desperately toward the surface with his good arm, waiting for release, his mind begging that they would now be satisfied, that now they would stop, bring him back, not make him take any more. Finally he broke surface, and then, quite abruptly, felt solid ground under his feet. Glancing back, he saw that the pinnacle was gone, and the sky had turned a horrid orange-yellow color. Panting, his strength spent, he staggered up on the shore.

But the shore wasn't right. With a burst of anger he saw the fearful, distorted shore line upon which he stood, the sand under his feet writhing and alive as little wisps of it rose about his ankles, twisting them, as if to throw him down to his knees. Stars were blinking up at him from the ground, and great boulders of black granite scudded through the sky, whizzing past his ears like huge, unearthly cannon balls. The world was changing, turning and twisting into impossible shapes and contortions, and he smelled the dank, sharp odor of chlorine in the pungent air.

With a scream of rage he threw himself onto the writhing sand, pounding his fist against it in helpless fury, screaming out again and again. He couldn't stand it any longer, this was the end, he couldn't fight any more—

They'd *have* to bring him back now, they'd *have* to stop—

A horrible thought split into his mind, bringing him to his knees abruptly. His eyes were wide, hollow-rimmed as he stared unseeing at the impossibly distorted landscape. Fear struck into him, deep, hollow fear that screamed out in his mind, a desolate, empty fear. Carefully he reviewed his ordeal, everything he had thought, and seen, and felt. For so long, he had been running, fighting—enough to satisfy any test, as much as he was humanly capable of fighting. To test his reactions, conscious and unconscious, his resourcefulness in the face of danger, his ingenuity, his resiliency, his fight, his drive, his spirit—they couldn't ask for more. Yet they still hadn't brought him back. Surely, if any human being had ever proved himself capable of surviving the fearful alienness of the stars and the worlds around the stars, he had proved himself.

But they hadn't brought him back—

The thought came again, strongly, growing into horrible certainty. He shuddered, a huge sob breaking from his lips. He knew, he was sure. He had been waiting, hoping, fighting until he had satisfied them and they would stop. But now he saw the picture, from a different angle, with terrible clarity.

They weren't going to stop. They were *never* going to stop subjecting him to these horrors. No matter how

much he took, no matter how long he kept going, they would never stop.

He had been fighting for a lost cause, fighting to satisfy the insatiable. And he could keep fighting, and running, and fighting, *until he toppled over dead.*

Anger broke through the despair, blinding anger, anger that tore at his heart and twisted his mouth into a snarl of rage. He had been bilked, fooled, sold down the river. He was just another experiment, a test case, to see how much a live danger-trained spaceman could stand, to be run to death on a treadmill like a helpless, mindless guinea pig—

For the greater good of humanity, they had said. He spat on the sand. He didn't care about humanity any more. To enable men to go to the stars! *Bother the stars!* He was a man, he'd fought a grueling battle, he'd faced death in the most horrible forms his own mind could conceive. He wasn't going to die, not in the face of the worst that Connover and Schiml and their psych-training crews could throw at him!

He leaned back on the sand, red anger tearing through his veins. It was his own mind he was fighting, these things had come from his own mind, directed by Schiml's probing needles, stimulated by tiny electrical charges, horribly real, but coming from his own mind nevertheless. They could kill him, oh yes, he never lost

sight of that fact.

But he could kill *them*, too.

He saw the huge rock coming at quite a distance. It was black, and jagged, like a monstrous chunk of coal, speeding straight for his head, careening through the air like some idiotic missile from hell. With bitter anger Robert Cox stood up, facing the approaching boulder, fixing his mind in a single, tight channel, and screamed "*Stop!*" with all the strength he had left.

And the boulder faltered in mid-flight, and slowed, and vanished in a puff of blue light.

Cox turned to face the shifting, junglelike shore line, his muscles frozen, great veins standing out in his neck. It's not true, his mind screamed to him, you can wake yourself up, they won't help you, but you can do it yourself, you can make it all go away, *you yourself can control this mind of yours*—

And then, like the mists of a dream, the world began fading away around him, twisting like wraiths in the thin, pungent air, changing, turning, changing again, as the last of his strength crept out of his beaten body, and his mind sank with the swirling world into a haze of unconsciousness. And the last thing he saw before blackout was a girl's sweet face, tearful and loving, hovering close to his, calling his name—

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He was awake quite suddenly. Slowly, he stared around the bright, cheerful hospital room. His bed was by a window, and he looked out at the cool morning sun beaming down on the busy city below. Far below he could see the spreading buildings and grounds of the Hoffman Medical Center, like a green oasis in the teeming city. And far in the distance he saw the gleaming silver needlepoints of the starships that he knew were waiting for him.

He turned his face toward the tall, gaunt man in white by his bedside. "Paul," he said softly, "I came through."

"You came through." The doctor smiled happily, and sat down on the edge of the bed.

"But I had to terminate the test all by myself. You couldn't have stopped it for me."

Schimpl nodded gravely. "That was the last step you had to take, the really critical step of the whole test. I couldn't have told the others about it, of course. They'd never have let me start the test if they had known. Connover wouldn't even stick with the part that he'd agreed upon. But without that last step, the test would have been worthless. Can you see that?"

Cox nodded slowly. "I had to rise above the physical reaction level, somehow, I had to force myself—"

"There's no way for us to know what you'll find, out there, when you

go." Schiml said slowly. "All we knew was what the others found, and what it did to them. They couldn't survive what they found. But we knew that training in reactive, fight-or-flight level of response to danger wouldn't be good enough, either. You would have to have razor-sharp reactions *plus* full rational powers, even at the very end of your physical rope. We *had* to know that you had that—" He reached over to inspect Cox's bandaged head for a moment, his fingers infinitely gentle. "If the horrors you faced had been fakes, to be turned off when the going got tough, you wouldn't have been driven to that last ebb of resourcefulness that will save you—when you go to the stars. That was the final jump, the one the others didn't realize—that you had to discover, finally: That *we* weren't going to help you; that if you were to be saved, ultimately, it *had* to depend on you and you alone. You see, when you go where the other starmen went, no one will be with you to help. It'll be you and you alone. But whatever alien worlds you find, you'll have a strange sort of guardian angel to help you."

"The training—"

"That's right. Training on an unconscious level, of course, but there in your mind nevertheless, a sharpening of your senses, of your analytical pow-

ers—an overwhelmingly acute fight-or-flight sense to protect you, no matter what nightmares you run into."

Cox nodded. "I know. Like you called it, at the beginning of training—a sort of a brother, hidden, but always there. And this testing was the final step, to see if I *could* survive such nightmares."

"And you'll take it with you to the stars, the nightmare knowledge and experience. It's hidden deep in your mind, but it'll be there when you need it. You'll be the next man to go—you and your nightmare brother."

Cox stared out the window for a long moment. "Mary's all right?" he asked softly.

"She's waiting to see you."

Robert Cox sat up slowly, his mind clear in the remembrance of the ordeal he had been through—a hideous ordeal. Terrible, but necessary so that when he came back, he would not be like the others had been. So that men could go to the stars with safety, and come back with safety.

Slowly he remembered his anger. He gripped the doctor's hand, squeezed it tightly. "Thanks, Paul," he said. "If I come back—"

"You mean, when you come back," said Dr. Schiml, grinning. "When you come back, we'll all have a beer together. That's what we'll do."

THE END

FOR THE GLORY OF AGON

BY IRVING COX, JR.

The essence of dictatorship is not merely that no citizen trusts any other nation; it is that no citizen trusts any other person whatever. Somehow break that mutual distrust, however . . .

Illustrated by Orban

In the red glare of the late afternoon sun they turbed away from the pioneer settlement, cut in the red soil of the desert. Brad headed the triangular-winged car toward the dome of the Earth colony which gleamed iridescently on the far horizon. He pulled his oxygen mask over his face, while the Martian watched him anxiously.

"Their story makes sense," the Martian said. He spoke slowly and precisely; his voice was soft and high-pitched, as delicate as his slim, wispy, six-armed body.

"They could be lying, Ran," Brad answered.

"They've been Rationalized!"

"Two hundred thousand of them? Six months ago they invaded the Solar Federation; now they're a member colony. Ran, the Rationalizer can't cure every —"

"The Rationalizer isn't a cure; it's not a machine, Brad. It merely persuades rationally thinking people to think rationally. The three hundred haven't escaped; they've simply taken one of their own ships and —"

"Which was prohibited when they surrendered."

". . . And gone back to Agon to arrange a treaty. That's their story,

WORK FOR THE GLORY OF AGON



Brad; it's true because it's logical. We've converted them to our way of thinking. Why shouldn't they want to take our technology back to their own people?"

"On the other hand, how do we know they haven't simply gone to explain the way we made them surrender?" Brad laughed, but without pleasure. "That surrender was a trick. A bluff! We don't have a weapon that could stand up against theirs."

"No. Nothing but civilization."

"You Martians are all alike. I suppose you'd turn back your enemies with a book of sonnets, or a nicely

pointed dramatic oration. You can't answer a technological development like their time-power with a handful of fancy words."

"Granted, their material technology outstrips ours; we've never built a Solar ship that could reach the stars and the Centaurians have discovered time-power. They attacked us with weapons that could wipe out a planet. Still, Brad, three Earth-people forced their fleet to surrender."

"Fortunately. It gave us a breathing space—time to prepare for their next attack. And what do we do? Waste it studying their culture, when

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we should be building weapons!"

"Brad, if we sacrificed all the resources on all our planets, we still couldn't build a war machine to equal theirs. The Solar Federation wasn't built on force. If we take your solution to the problem, we'll betray ourselves defending ourselves."

"More Martian double-talk. What do you want us to do? Sit and talk while we wait for them to come again? When I make my report to the Assembly, Ran, I intend—"

"At least consider the data I've collected, Brad." The Martian put two of his arms on the younger man's shoulder, in the traditional Martian gesture of friendship. "You've only gathered information about their ambassadorship; you need my data to fill out the picture."

"Ambassadorship! I dare say the motives of our Centaurian colony were logical enough. The trouble is, Ran, their rationalization may destroy us. As long as the Centaurians didn't know why their first invasion fleet surrendered, they hesitated about sending in the second team. How could they be sure we weren't better armed? Now these three hundred starry-eyed ambassadors run home and tell the truth! The rest is inevitable."

"The Federation will still defeat them," Ran declared quietly.

"The first surrender was a fluke. We succeeded because they were foolish enough to allow three Earth-people to approach them with the

Rationalizer. This time they'll keep their distance and lob death at us from somewhere out in space."

The turbine car slid smoothly into the landing flat. Brad and Ran entered the dome of the Earth-colony through the public vapor germicider. In the reconstructed atmosphere of the city, Brad removed his oxygen mask; the fragile Martian slipped a filter over his gill disk to reduce his intake of air to the less heady Martian mixture.

Ran went to his apartment in the second-level Martian sector; Brad took the lift to the top level of the city, where the luxury hotels were built on winding boulevards beneath the transparent city dome.

Brad was traveling on a Governmental Institute expense account, or he could not have afforded a suite in the Royal Martian. Ran could have been there, too, but he preferred the comforts of the Martian sector when he was on his native planet. No other Institute would have provided luxury accommodations, but the Governmental Institute was the oldest of all the Agencies and its standards were thoroughly encrusted with the diplomatic heritage of the past.

As the blue, plastic door slid open before Brad, the telescreen began to flicker insistently. He snapped down the recognition lever; the thin face of the Martian operator came into focus.

"Mr. Howard Brad?"

"Speaking."

"We have an Earth-call, Mr. Brad."
"Put it through."

Brad dropped on the arm of a lounge and pulled out a cigarette, while he watched the six-armed dexterity of the Martian operator. Brad was still a young man, tall, slim and intelligent. His face mirrored a deep-seated conscientiousness and the harassed frown of a man who had successfully completed the tortuous training of the Governmental Institute. High cheekbones and dark eyes gave his face a slightly Oriental appearance; his thick, wiry mass of yellow hair clung like an unkempt crown to his head.

The rectangular view of the Martian transmission station faded from the screen and Brad looked into the Communications Center of the Assembly building in London. A young undersecretary addressed him,

"Is your report completed, Brad?"

"I can give you an interim, but I'd rather—"

"We want a full official."

"In person?"

"Tomorrow. We're calling in both you and Ran. You're scheduled to address the Assembly tomorrow afternoon."

"You'll notify the Martian?"

"There's a call in for him; he'll get it as soon as he comes in. You can both take the night sleeper, I think."

If Brad had not been so carefully schooled in the manners of diplomacy, he might have gushed his gratitude. Nothing could have suited his purposes

better than this unexpected opportunity to appear before the Solar Assembly. He was well aware that the Assembly, staffed by senior diplomats elected out of the full body of Governmental Institute men, was an exasperatingly deliberative organization. It could seldom be moved to hasty action, even by an overwhelming array of specific social data.

And this was not the time for deliberation! Somehow Brad must find words to convey to them the sense of imminent danger that he felt himself; somehow he must make them see that this foolishly idealistic ambassadorship of the Centaurian colony had destroyed the Federation's only defense.

Brad dialed a light supper, which a silently efficient hotel robot served in his room. The food Brad ordered was a sweet, synthetic protein, which his body could convert into energy within half an hour. It was the prescribed pre-flight meal, designed to mitigate the acceleration nausea. Brad swallowed the gelatine with a frown of distaste; he had never become used to it, in spite of the many flights he had made as a diplomat of the Institute. It was currently rumored that the acceleration sickness would disappear when the time-power used by the Centaurian ships had been adapted to Federation designs. That day could not come too quickly for Brad.

He was pulling on his light, rubber-

ized flight suit when Ran knocked on his door. They turbed to the Interplan Port together. The Martian was wearing a plastic shell which preserved around his flimsy body the atmosphere and pressure of Mars. The scores of intricately engineered joints in the protective shell were powered by tiny motors which adroitly assisted the Martian's muscular movements when he entered the crushing gravitation of Earth.

Brad and Ran took the mid-section compartment in the commercial cruiser, a space always reserved for Agency personnel. As soon as the ship was in free flight, Brad lay back on the cushions, bracing his body against the encroaching nausea of weightlessness. He took a deep breath and gulped a Pepperwood capsule.

Ran settled slowly on the edge of Brad's lounge. "Brad," he asked, "do you still intend to ask the Assembly to arm the Federation?" His voice rang hollowly as it was transmitted through his plastic face mask.

"Of course."

"It's already too late."

"You're a defeatist, Ran. Look at the gadgets we've built for our comfort! If the Federation can just convert that same energy to making weapons—"

"And, if we do, we destroy ourselves. Brad, you've never taken the time to look at the social data I've assembled on Mars; let me show it to you now."

The Martian opened a small box and took out a Primary Teacher. It was a commonplace device, used by all the Institutes for basic teaching to children before they had learned the semantic symbols. Based upon the Series 600 Calculator, the machine projected on its miniature screen ideapictures derived from any symbol context fed into it. For an initial education it was an ideal device, automatically weeding out and discarding all linguistic abstractions. When the machine was used consistently by a very young child, the child subconsciously learned to read all semantic symbols in the same manner.

Into the Primary Teacher Ran fed the transcript of the testimony he had assembled at the Centaurian colony on Mars.

"Many of the questionnaires I submitted to our colonists," the Martian explained, "contained a number of subtle inquiries about their Empire and the everyday lives of their people. When we collate the answers and arrange the information in a logical sequence, we get—" Ran gestured toward the screen. "See for yourself, Brad. Remember that the language symbols of the Agonians will be automatically translated into our own Basic, because the questionnaires were answered in our language."

On the small screen of the Teacher Brad saw a stylized, astrogeographical view of the Agonian Empire, the nine inhabited planets of Alpha Centauri.

He saw the tremendous, time-powered cruisers moving on scheduled runs between the nine worlds; the chains of sky freighters carrying raw materials; and the endless squadrons of armed battle cruisers policing the heavens. This last was an uncomfortably disturbing phenomenon, for the number was countless. Only seven police ships patrolled the entire Solar Federation.

The first picture dissolved and Brad saw the central planet of Agon, and finally the sprawling streets of the Agonian capital. It was not the gay, light, domed city of the Federation, but a bleak, filthy place, choked beneath a pall of industrial smoke. The buildings towered high above narrow streets, in an unplanned confusion, and everywhere Brad saw teeming mobs of people moving sluggishly, like animated machines. The gray and black tunics they wore were suitable companion-pieces to the dismal factory rooms where the Centaurians worked.

"But, Ran!" Brad whispered. "They do the labor themselves. They have no robots!"

Ran said nothing. The pictures wound on. Brad looked into the interiors of the clifflike rooms where the Agonians ate and slept, dimly lighted, poorly furnished dens. The walls were blank and stained. The food was sparse and unattractive. Nowhere was there anything which his Earth-trained eye would have identified as beautiful.

In the next series of frames, Brad

saw the gigantic capital of Agon at night. Even then the sluggish millions swarmed in the streets. And throughout the night the machines ground and clattered in the vast, dirty factories. Signs flashed in the smoky sky from towering buildings. Several were single-word admonitions to "Work!" Others became more specific, "Work for the Glory of Agon." Over the factory workbenches Brad saw the same monotonous slogans endlessly repeated.

On the outskirts of the bleak city were the vast military establishments, the barracks of the planetary police crowded close to the training fields of the space school. Squads of men were drilling smartly, wearily, without relief and without repose.

"Apparently, they have no robot infantry, either," Ran said.

The pictures slid together in a whirling montage, as identical scenes were repeated on all the other planets of the Agonian Empire. Then Brad saw thousands of Centaurians toiling in the underground mines torn in the earth, others grubbing in the bleak fields. All the mineral resources, all the physical resources, all the mental resources of a complex planetary Empire—all the rich potential of a solar world—were channeled finally into a single creative outlet, the great industrial plant which made up the city.

And the end product was armament.

The final series of pictures portrayed the rulers of the Empire, the High

Council of the Agon Class. Even among the aristocracy Brad saw no evidence of an advanced consumer technology. The wealth and the genius of Agon flowed only into its military machine; nothing remained to satisfy even a minimum of creature comforts.

As the pictures flashed out, Brad said, "So much military strength! Are they afraid of an attack? Some unknown enemy more terrible than the Agonians themselves?"

"I found no evidence in my interviews."

"Then this High Council of theirs uses the enormous police power to keep the people enslaved!"

"No, Brad. There is no sort of opposition on Agon to the rule of the Council. The people accept it because they always have. They know nothing else. Agon has always been an aggressor; they've never lost a war. The Empire began on the planet called Agon. They gradually conquered the other habitable planets in their system and wiped out the native species before planting Agonian colonies. That seems to be what they mean to do here. We're their closest star neighbor and, after they had discovered time-power, I suppose they began to look around for new worlds to conquer."

"Why, Ran?"

"I'm not absolutely sure; but I think I can make a good guess. Once, long ago, aggression solved a problem for them. It worked. They've never

tried anything else. Aggression has become a mass psychosis with them. The act of violence is its own reason and its own end."

"You admit that, and still tell me the Federation doesn't have to arm itself? Ran, we've got to make the Assembly understand! If they vote immediate emergency measures to create a military defense—"

"You saw the Agonian arms, Brad. We couldn't duplicate them in a decade."

"We have to try, Ran!"

"We can never defeat them, if we fight on their terms, Brad. But if we can engineer them into fighting on ours—"

"Are you going to show this reconstruction to the Assembly?"

"Yes."

"I thought you disagreed with me!"

"I do. Military action won't save us."

"But if anything can stir the Assembly into facing the facts, this is it."

The Martian laughed. "Oh, yes; the conclusion is self-evident. I didn't think you'd see it so quickly, Brad. Your fear of another invasion has seemed to blind you to the obvious facts. Congratulations."

Brad found it a discomfiting answer. Of course the facts were obvious! But somehow Ran's tone suggested typical Martian double-talk, a mocking, almost derisive sham of innocent agreement. Brad tried subtly to pry for something that would be specific.

But the subtlety of an Earthman was child's play to a Martian's teasing torments of verbal logic. Brad got nowhere. After half an hour of inconsequential sparring with abstractions, Ran curled up on his cushion and went to sleep.

Early the following afternoon the cruiser grounded on the landing flat north of London. Brad and Ran chartered a robot turb which, in three minutes, took them through the public vapor germicider into the gleaming dome of the Federation capital.

Unlike all the other cities, London had only one level, a carefully landscaped pattern of white marble buildings erected on the banks of the Thames. In the blaze of disastrous atomic wars that brought Earth's medieval period to an end, the old London was leveled; on its site the new Solar capital had risen. The circular city was trisected by transparent walls which met within and above the central Assembly Hall. One third of the city was built for the Earth-people; one third for Martians; and one third for Venusians. In each section the atmosphere of the home planet was chemically reconstructed; and in each section were available the individual foods, plants and wild life which were characteristic of the three planets in the Federation. The Assembly Hall was similarly partitioned, so that representatives from the three worlds could meet and govern in

physically comfortable conditions.

Both Brad and Ran were members of the Governmental Institute, classified as Diplomats. The full personnel of the Institute—which was the largest of the Agencies—was drawn in exactly equal numbers from each of the three member planets. The initial selection was made on a basis of a popular vote; but, as soon as a candidate was elected, he had to qualify for office by means of an exhaustive education in governmental procedure. The education extended over a five-year period. Annually the ranks of apprentices were thinned as much as a third by the Fitness Evaluations. The vacancies were filled by candidates of the same planetary origin, so that the species balance was always maintained. Those who eventually met the qualifications earned the initial rank of Undersecretary, serving as glorified clerks in the London office for three additional years; after passing the Final Evaluation, the Undersecretary was classed as a Diplomat. He held that rank permanently. From the Diplomats the Five-Year General Elections selected, by popular vote, the three hundred Representatives who governed the Federation.

The prevailing attitude in such a government was its unhurried, restrained deliberation. The quiet calmness of the Diplomat-politician was so characteristic it had become the jump-off point for half the ribald humor in the Federation. London was a haven

of peace, a Delphic Oracle—in terms of the scientific method.

Yet, when Brad and Ran entered the reception gallery of the Assembly Hall, they were caught in a bustle of excitement. Nothing in their training—nothing in governmental tradition—had prepared them for such an experience.

A scurrying undersecretary stopped suddenly in front of them.

"You're the diplomats just in from the Centaurian survey?"

"Yes," Brad answered.

"I thought I recognized the Martian. Have you heard the news?"

"No. Don't tell me the colony—"

"One of their ambassadors is back! They're still processing the first-contact recording up in Communications."

"What's wrong?"

"You . . . you'd better judge for yourselves."

Fearing, perhaps, that his emotionality had been an unwarranted breach of custom, the undersecretary quietly vanished in the moving throng. Ran and Brad ascended the broad, curving stairway to the Communications Center. There they found the Governmental Director himself—currently, an ancient Venusian who had already served four times as a representative. Stooped, heavily wrinkled, his dorsal scales faded with age, he turned and waved an affectionate greeting. But he was clearly very perturbed. His small face scales stood almost hori-

zontal with anxiety, and his throat undulated nervously as he talked.

"You're Howard Brad?" he asked.

"Yes; and this is Ran. We were assigned the colonial survey."

"Glad you're back. The Assembly is waiting for your report. It may give us a clue . . . but you must have left Mars before you had the news! One of their ambassadors has come back."

"Only one?" Ran asked.

"The others are—" The director's rumbling, froglike voice choked and his face scales shook with grief. "So foolish a sacrifice! But they seem to have understood their own people very well. After the ambassadorship had landed on Agon, they sent their ship back into space for safety. One Centaurian was left on board. Under certain conditions he was to return and warn us. Here, let me run through the recording for you."

The director turned the re-play dial and on the telescreen Brad saw the scene which had been recorded some hours before. It was the anxious face of a Centaurian, slightly distorted by spatial static. Behind him Brad saw the vague shape of the colony on Mars.

The Centaurians bore a remarkable physical resemblance to Earthmen. Their bodily structure was so similar that the Biological Institute suggested that the two species could interbreed. The chief difference was in size; the tallest Centaurian in the colony was not quite four feet tall. And the

Centaurians had proved to be vastly more adjusted to the thin, Martian atmosphere than to the heavier oxygen content of Earth air.

"I was asked to bring warning," the Centaurian said. His voice was guttural, the accent faintly metallic. "Our mission has failed. They questioned us until they knew why our first invasion fleet had surrendered. Then they executed the others by—"

The recording jumped and the director whispered, by way of apology,

"I had the details of the process edited out of the recording. It seems so lacking in dignity to preserve a permanent record of such barbarism."

"... And, when the proper signal was not given," the Centaurian went on, "I escaped. The Agonian Empire will attack the Federation. I am entirely certain of that. Otherwise they would not have Rectified our ambassadors so brutally. Once a decision is made, they act upon it immediately. The second invasion fleet may be no more than half a day behind me."

The director snapped off the machine. "Their fleet has already been sighted by our observatory on the Saturnian outposts." His aging face shook. "It is only a matter of minutes, I think, before they'll attack us."

"Their strategy is clear," Ran said. "They know they were defeated before only because they allowed our people to contact them physically. They'll have to destroy us from space, where they can still be immune to

Rationalization."

"And you said we needed no defenses!" Brad cried.

"Mere destruction?" the director murmured. "They could have no logical motivation for—"

"Of course not," Ran intervened. "They want conquest simply for its own sake. However, if they use spatial weapons, they'll make the planets uninhabitable, even for their own colonies. They would win nothing. And what they want from us—" Ran's voice came to a dead stop. He staggered weakly against the recording machine. "Their own colony! Of course! It's one factor I omitted. But we still have time enough, I think." He turned to Brad, putting two hands on his shoulder warmly. "Brad, go down to the Assembly and make my report for me, exactly as I did last night. They'll understand our position, I believe, and know the kind of action I would recommend."

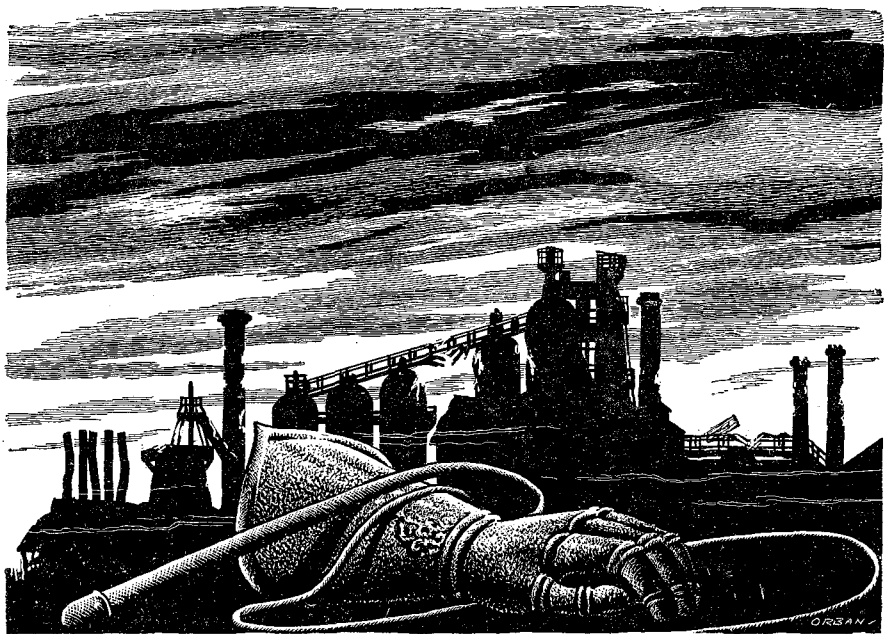
"If they don't," Brad said through clenched teeth, "I can make it clear enough!"

"My dear friend!" the director exclaimed with alarm. "Such an emotive response! I don't think you quite understand—"

"Let him go," Ran advised. "His feeling is understandable and—"

"Understandable!" Brad nearly choked on the word.

"... And entirely harmless. If you need me, Brad, I'll be here with the director. There's a little matter of



an emergency on Mars we have to take care of."

Brad entered the vast Assembly Hall through the Diplomat's gallery. The glass-walled room glowed with the warmth of subdued sunlight. Behind the transparent atmosphere walls the three sections of the Hall were crowded, and a debate was under way. But its subject matter nearly shattered Brad's sense of reality. A vicious invader was approaching the Solar Federation, and the governing body, with dignity and undisturbed poise, was discussing the appropriation for the summer water games on Venus!

In due course the item was tabled, and the Speaker introduced Brad. Coldly Brad gave a sketchy introduction of the colonial survey he and Ran had made. Then he fed Ran's social data into a Primary Teacher and jacked the projection into the master telescreen, which the obedient robot attendants had carried into the Hall.

When the projection was finished, Brad allowed for a brief silence—an eloquent silence, he thought—before he began the formal report. He knew exactly what he would say. The phrases were clear and compelling in his mind, polished by his depth of conviction. The enemy was at hand, true. To-

night, or perhaps this afternoon, the Agonians would hurl demonic fire at the Federation outposts. It was disaster but not defeat. The Federation was still large and rich. The technology which had created robots, calculators, the germ-free dome cities—all the gadgetry of civilization—could surely improvise some sort of temporary protection. A few of the citizens of the Federation would survive. Eventually they could strike back at the Centaurians and drive their invasion fleets from the sky; they could pursue the enemy to his own Empire and lay it waste.

The speech was clear in Brad's mind; it would have made an impressive oration. But he never had an opportunity to deliver it. He had, somehow, miscalculated. His eloquent silence lingered a split-second too long. An Earth representative arose and asked for the floor.

"We are grateful to Diplomat Brad," he said, "for this insight into the forlorn sociology of our unfortunate enemy."

"Unfortunate?" Brad stammered.

"A sad people who have wasted themselves and their wealth in the pursuit of an illusion. They are like lost children, desperately in need of rational guidance."

Brad recovered from his first shock. "Pity no doubt demonstrates our own sophistication and enlightenment," he said dryly. "But it scarcely serves to turn back an invader. We still have

time to do that! If we vote emergency military measures at once—"

A polite muttering fluttered over the audience. The Speaker perfunctorily banged his gavel for order.

"You are invited here to report data, Mr. Brad," he said, "not to propose a course of action."

"You must listen to me! This is not a thing we can discuss forever in our polite political vacuum. It means the end of—"

The gavel banged again. A Martian representative arose and said gently,

"Diplomat Brad, your intensity of emotional reaction is clear and, perhaps, even excusable. But you are thinking with your senses! Our Federation is built on co-operation, on a peaceful union of rational minds. Even if we could adopt the course you suggest, we would destroy the substance of our union in the process. No enemy can defeat us, Diplomat Brad; a rational people can be defeated only by itself."

"Words! That's all you're saying! Do we build a barricade of words over our heads when their fire rains down on London? Do we knock their ships from the sky with a few well-placed adjectives?"

The robot attendants had not yet removed the telescreen from the Hall. It began to glow suddenly, dissolving into a poorly relayed picture from Mars. Brad saw the red earth, churned up before giant prongs of fire. He thought, for a moment, that he could

identify the outline of the Centaurian colony; but it was gone in a mist of flame and dust. Above the din of destruction, he heard the voice of the Martian announcer,

"... First pictures of the Agonian attack. Curiously they have restricted their fire power to the colony of their own people, although the range of the attack may change at any moment."

Brad sank back against the wall. The voice ground on, but the words made no sense to him. The destruction, he knew, was only a foretaste of the final chaos; and still the Federation did nothing! The representatives sat impassive on their benches. And Brad's world was lost.

Abruptly the blaze of flame was gone. On the telescreen Brad saw a shattered landscape, vast square miles of Mars smoldering with the dying fire of eternal death. On the perimeter of the wound the ground was unharmed. Brad saw the gleaming dome of an Earth colony still standing untouched on the horizon.

The telescreen was suddenly torn by a flashing pattern of interference. The voice was cut off and another thundered into the Hall—a guttural, metallic voice, using the Basic Federation tongue awkwardly:

"In this way do we punish our traitors! This is a warning to you servile fools who call yourselves the Solar Federation. We are the men of Agon, and Agon is invincible. We have

come as your conquerors. Take warning and meet our terms at once, or one by one your cities and your soil will be burned by our flame from the sky. For the glory of Agon!"

The screen went dead.

Doggedly Brad watched the representatives. Many expressed acute pain at the violent death of the Centaurian colony, but that was the only emotional reaction Brad could detect.

One Earth representative said:

"They'll want to make a treaty, naturally. It was implicit in the data Diplomat Brad presented."

"They'll probably try to seize our resources," another added.

"I'm not sure. They're still afraid to contact us directly."

"The whole thing hinges on the wording of the treaty. I suppose a Martian could be delegated—"

"Not a Martian treaty! Even an invader like the Agonians doesn't deserve such a punishment!"

Brad flung himself out of the Assembly Hall, overcome with disgust. The Federation was weak, a sham that could be swept into oblivion at the first threat of superior force. They would not attempt to defend themselves. They had no courage, no valor; nothing but an empty facade of pretty words. The children of such a people—if any were permitted to survive—would have no glittering legends of bravery, no giant heroes to carry with them into the ignominious night of surrender.

No heroes! The structure of the Federation suited every potential of rational thought—but it created a society without greatness. The people of the Federation had chained themselves to oblivion by the logic of science. Courage needed the tinge of emotion, the kiss of irrational daring.

Brad went to his room, in one of the hundreds of barrack-villas built on the outer edge of London. Although it was late afternoon, the traditional tea-hour, that part of the capital was deserted; all the personnel of the Institute had gathered at the Assembly Hall to assist in the negotiations with the Agonians.

Negotiations, Brad thought bitterly. Not one man among them had considered physical resistance. They were terrified by a show of force, trapped by their softening cultural ideals.

With trembling hands, Brad penned his resignation from the Governmental Institute. That, he knew, would be more of a shock to the Assembly than the Agonian attack. No one had ever resigned from the Institute before.

Brad left the envelope on his desk and slipped out of the city. His mind was assailed by chagrin and shame. He could make no clear decision, except that he wanted to get away from the gemlike order of the city—the glitter that symbolized cowardice. He wanted to get away from rational beings, those

sophisticates who were so unwilling to accept the dangerous responsibilities of courage. If he could, Brad would have written his resignation from mankind itself.

He stumbled past the bustle of the landing flat, past the out-city settlement of commercial warehouses and processing plants, all busily serviced by corps of robot labor. Brad knew he was running away and he knew the gesture was futile, for ultimate escape was impossible. He was not merely withdrawing from a man-made Institute, but running from himself.

At dusk he halted in the shadow of a grove of trees close to a roadside tavern. The gleaming turbs of half a dozen vacationists stood on the tiny landing flat in front of the tavern. Within the building the telescreen danced with the pulsing chaos of the day's news.

The picture was beyond Brad's line of vision, but faintly, shattering the temporary peace of the grove, Brad could hear the voice of the announcer:

"... Yet the initial peace treaty will be concluded this evening. The Agonian fleet has made no new attack; only their own colony on Mars has been destroyed. The Agonians are still afraid to meet any Federation delegation directly; the lesson of the Rationalizer was well learned, apparently. The Agonians insist upon conducting the conference by remote control, which has led to some delay

on methods of discussion—”

Brad turned away and ran again. He found himself on a thickly overgrown country lane which led toward the Thames. In the hardened mud of the road he saw occasional ruts still preserved, the last lingering relics of the surface cars which had been so popular before the turb was developed.

The winding lane, sweet with the scent of honeysuckle in the twilight, was vaguely familiar. Brad recognized it at last when he reached the river and saw the deserted, collapsing cottage clinging to the grassy bank.

In Brad's apprentice days he had often come here with Ran. They had found the cottage and they had often used it for undisturbed study when they were preparing for the annual Fitness Evaluations. Many of their books and notebooks were still in the cottage.

Brad realized that he had unconsciously taken the old road, retreating from the crushing disaster of the present into the golden memory of the past. In his apprenticeship he had believed in the Federation, in the ideology which united the three planets. Now he wanted to find his old faith again—even though reality made that impossible.

He went into the cottage. With approaching nightfall, the spring air had turned chilly. Brad made a fire on the hearth and, by the light of the dancing flames, he began to leaf through the discarded books he and Ran had left

in the cottage.

For a long time he lingered over the yellowing pages, so damp with mildew. He found the notes he had taken in the introductory class in philosophical history. Blazing across a page was a verbatim quote he had once copied down,

“The brave man is not he who feels no fear, for that were stupid and irrational; but he whose noble soul subdues its fear and bravely dares the danger nature shrinks from.—
Joanna Baillie.”

Furiously Brad threw the notes into the fire. He collapsed on a battered settee and wept—wept for himself and for man, who today had betrayed his heritage.

He heard a light footstep outside. He looked up and saw Ran at the door. The Martian held a small envelope. Very quietly he said,

“I thought I'd find you here, Brad.”

“Leave me alone!”

“I brought you this.” Ran held out the envelope. “Your resignation. I knew you wouldn't want anyone else to see it.”

“How thoughtful of you! How wonderfully civilized!” Brad's grief fell away into an immense gulf of strangling bitterness. “You can watch a colony destroyed by our enemy, and still remember the fine points of governmental etiquette.”

“But the colony on Mars wasn't destroyed, Brad—just the empty build-

ings. That's why I asked you to speak to the Assembly for me. It was one detail I'd overlooked. I wanted the director to use his emergency power to evacuate the Centaurians before the Agonians made their attack."

"So no one was hurt." Brad laughed. "To the last we hold to the nonsense of rationality! I'm sure the Centaurians will appreciate being saved from death—for slavery."

Ran put two hands on Brad's shoulders; Brad jerked away.

"Stop thinking with your feelings!" the Martian said sharply. "We've lost nothing except a few square miles of Martian desert, and the treaty has been signed. It is a Martian treaty, Brad. We've won the war."

Brad stared at the plastic face mask of the Martian, gleaming in the yellow light of the fire.

"We've won the war, Brad, by conceding all their demands—and suggesting a few concessions of our own."

"We win by surrendering?"

"We've surrendered only things, Brad; they've surrendered an idea—though they're not aware of it yet, and when they do understand it'll be too late. The solution was clear as soon as my social data was compiled. Consider the problem from the Agonian point of view. Their whole society is organized for conquest. Simply that; nothing else. You saw their slogans. 'Work! Work for the glory of Agon!' They don't promise their people com-

fort or booty. Nothing except glory—a totally abstract concept without any specific meaning."

"I realize they were afraid to land; we had a Rationalizer and if they contacted us directly, they would be persuaded to surrender," Brad admitted. "But how does that keep them from destroying us as they did the Martian colony?"

"Their technique has always been to take the planet and wipe out the native species. You saw how they built their Empire. In our case, if they destroyed one they had to destroy the other, too. They would end up with nothing—nothing tangible to satisfy the glory of Agon. That gave them their first new problem in centuries. They couldn't solve it. They're psychotics, Brad; and a psychotic has definite, self-imposed limitations upon his ability to improvise—to find new answers, when the old ones don't work. All the Agonians could do was vary the old technique a little and threaten us into capitulation."

"So they enslave us by remote control. I don't believe I'm quite civilized enough to see how that wins the war for us, Ran."

"I said we had made a Martian treaty, Brad. The only thing they could demand of us was raw material. We gave them the impression that our metals made impractical weapons. It seemed to explain—at least to their satisfaction—why we hadn't defended

ourselves. But there's another kind of raw material that we can furnish them—labor itself."

"So we buy peace at the price of the dignity of our people!"

"No, Brad; they won't take slaves home to work in the Agonian factories. They're afraid of us, remember? Here in the Federation we'll do their work, and our labor is entirely robot labor. It costs us nothing in physical effort or ingenuity; and the Agonians have agreed to supply us with the raw materials. The Federation is simply their workshop, Brad. After this, they'll relax and use the products we create."

"And this you call a victory?"

"Consider their social pattern again. Millions upon millions of them work forever, day upon day, in their dingy factories. They have nothing else to fill their lives or give purpose to their existence. They labor for the glory of Agon. It is a sacred dedication; the labor is necessary for them to feel any sort of individual fulfillment. They don't know how to perform any other service to the glory of Agon." The Maritan sighed unhappily. "Now we've taken over their jobs."

For the first time the bitter, twisted smile disappeared from Brad's face. He turned slowly toward the Martian, his eyes wide with amazement.

"My apologies, Ran! So we become their workshop, and take the purpose

of existence away from untold billions of their people. We'll wreck their economy!"

"More than that, Brad—their social order. I wish we could have defeated them with less punitive measures. Only a thoroughly sane people could adjust to so sudden and violent a change, and the Agonians are psychotic. When the Empire falls apart, we might be able to pick up some of the pieces and Rationalize them."

Brad took his resignation from Ran and tossed it into the dying fire. "As you said—it's a Martian treaty."

"The only thing we could do, on the basis of the social data. Brad, you were panicked by fear; and fear short-circuited your ability to think rationally."

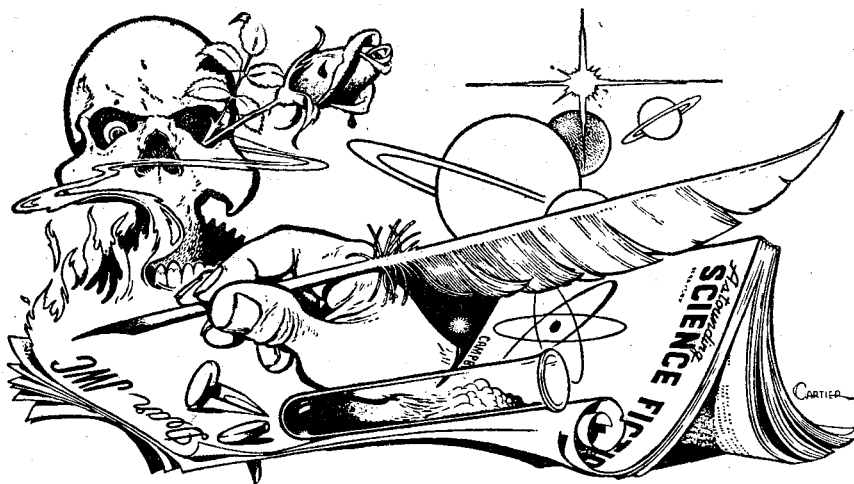
"I've acted like the Agonians." Brad smiled. "If the emotional anguish I've been through were to happen simultaneously to an entire culture—" He shuddered. "It isn't going to be pretty, Ran."

"War never is—whether it's fought on their terms, or on ours."

Arm in arm they left the cottage and walked back the sweet-scented lane toward the Federation capital, talking and laughing together as they had when they were still Institute apprentices cramming for the Fitness Evaluations. Above them the stars rode bright in the evening sky.

The sky itself was clear.

THE END



BRASS TACKS

Dear Mr. Campbell:

After having read twice your Editor's Page of ASF, March, 1952, entitled "Social Pattern," I have decided to write you and state my feelings about this matter.

In order to make my exposition as understandable as possible, I wish to state the following beliefs:

1st. I am a relativist in EVERYTHING.

2nd. I believe in no ideals as such, only relative to something defined as better or as worse.

3rd. From the above, I believe I may conclude that anything labeled "good," "bad," et cetera, is only relative to the person or group which

says it, and relative to the time, place, upbringing, et cetera, in which that person or group has, or is, developing. Therefore, whatever I may say is also influenced by an uncountable number of "facts" which are not possible to evaluate, but which I am conscious of existing.

RULES OF GRAMMAR: If we could abolish, or at least change radically, what is known as Literature, I think we would have taken the first step in the right direction. We would have to adopt "Logical" rules, and not ones depending on the fancy and fame of any person. This would eliminate, or tend to, at any rate, all non-logical rules, leaving only the ones

necessary, to which we should have to add new ones.

PRONUNCIATION: We would then make simple rules for pronunciation; in which each symbol has one, and one only sound; Spanish is near to this, but not quite enough.

RULES OF THE CULTURAL MATRIX: Our present matrix is quite insane, not to call it insane, and I think that the first step is to try to explain what really goes on in our minds, conscious or not. I believe that the so-called first law of existence, namely, the law of self-preservation, is practically the only law in this field, and that all the others are simply extensions of it. I say that self-preservation includes intrinsically the superego of each being striving for self-preservation above the rest. Thus, I can explain to myself such things as ambition, lust for power, striving for knowledge, et cetera. A teacher derives immense pleasure when he teaches and the pupils understand him well. He also receives frustration when they don't understand what he tries to explain. Why? In the first place, when he explains, he is consciously or unconsciously realizing that he knows more than those listening to him. If they understand him, then he knows how to explain pretty good, and he feels elated. He then proceeds to call them intelligent, and so on. If they don't understand him, he feels bad, 'cause he doesn't explain very well, and he proceeds to tell them—or

to think it—how dumb they are, et cetera, so that he puts the blame on their stupidity, and not on his incompetency. He is, both times, superior then those before him. Is this so mutually exclusive?

"Pride is a deadly sin," you say, and then continue: "But pride is a sense of strong respect for one's self and one's own accomplishments. Social Postulate No. 114-B holds that pride is Indecent. But Social Postulate No. 79-A holds that Lack of Self-respect is Indecent.

"The Expressed Code of Society, as defined by those factors permissible in "Polite Conversation," and expressible in movies, radio and newspapers, differs violently from the Reality Code of Society. The Expressed Code holds possessiveness and pride of possession to be improper, something to be scorned. The Reality Code holds that an individual who does not have pride of possession, and covetousness enough to get possessions, is an object of scorn."

Why not classify the above as follows: If your pride is so strong that it "sticks out," and you have reason to be proud, the next person is going to think of you as being superior to him, and so you are his enemy. How is he going to be superior to you? Simple. He simply says that you are bad, a crook, immoral, a corrupter, an advantage-taker of humans' good faith, et cetera, et cetera. So he is now a good person, humble, et cetera.

For ASF's sake, how many times do you hear people say, "I don't like to criticize, but do you know—" And if you are unsuccessful in your enterprises, even though the next person is also unsuccessful, why, how simple. You are unambitious, lazy, stupid, et cetera, and the other person is therefore superior, his failings and failure easily being explained as "bad luck," and such. Or else, he thinks: poor you, in spite of all your strivings, intelligence, et cetera, you have had back luck, and are therefore an object of pity—but pity is really a sentiment of superiority, for it means breakdown of the object pitied, insufficiency, et cetera—and so you are again inferior to the next person, who feels very satisfied—though not openly—of your failure. Does the above explanation, IF YOUR MORALS LET YOU BELIEVE IN IT, seem to signify accepting "TWO MUTUALLY EXCLUSIVE POSTULATES"? I believe not, and furthermore, I believe that what I have just stated fits the "facts" we have about so-called "human nature".

POSTULATES FOR "COMPLETE" ROBOTS: Basing myself on what I have just said, and on the beliefs stated at the beginning, if I were a robot engineer faced with the problem of inculcating a robot having "infinite" memory, great analytical ability, and capable of "perfect" logic and computation with the rules of Society, and BESIDES, capable

of self-preservation, I would have to give him—or it—as the FIRST LAW FOR ROBOTS: ALWAYS DO THINGS IN SUCH A MANNER THAT IT WILL APPEAR THAT YOU ARE REALLY INFERIOR TO EVERY OTHER "THINKING" BEING. HINT: Whenever you make a correction, do it in such a manner that the person or group being corrected thinks it is he or it, and not you—robot—who is making the correction.

If this "FIRST LAW FOR ROBOTS" holds good before you, Mr. Campbell, then I would like to hear so, and then, if you accept, we could try to go on and postulate the SECOND LAW FOR ROBOTS.—R. A. Esquivel C., Casa No. 2552, Ave. 1, San José, Costa Rica.

I don't like it, even if it does make sense!

Dear Mr. Campbell:

Congratulations on the August ASF—a most excellent and well-rounded issue. In fact, so well balanced were the contents that I can't for the life of me give an immediate AnLab report. Perhaps, after a few months, when I pick the magazine up for re-reading, I'll be able to tell which is the "best" story—operationally defined as "the story which I most feel like reading again."

Incidentally, here might be an interesting thing to try—I don't know

how workable it would be—to get ratings from those of us who collect ASF on how well we now like the stories in, say, the issue of August '51. Comparison of the ratings made at the time with those made after a year's lapse might show some interesting shifts in preference.

Your extended comment on physical versus social science and the world situation—appended to Mr. Boehmy's letter—gets a decided agreement from this psychologist. Indeed, your general point of view can be applied to even less extended situations. I must confess that, in spite of some years of training and the possession of a few elegantly lettered sheepskins, I still can't get my children to go to sleep nights! I suppose—If I may be permitted the small rationalization—that I'm like the theoretical physicist who has to call in a repairman to fix his radio.

In many ways, the present condition in the social sciences is curiously parallel to the situation in the physical sciences during the early stages of the industrial revolution. This was a time of revolutionary development in the iron industry; and yet, as Conant has pointed out—in *Science and Common Sense*—"Lavoisier's new chemistry was not generally accepted before the nineties, and therefore almost all improvements in iron and steel manufacture were made before the fundamental chemical distinction between cast iron, wrought iron and steel was

recognized."

One final comment—and a heartily approving one—on Winter's fine article about psychosomatics. I have seldom read a better account of the problems, ideas and goals of the workers in this field.

All in all, one of the most pleasing issues of ASF that I have read in some time. One small query: isn't anyone submitting good serials to you, or are you saving them for the winter months, when those of us who haven't subscriptions are less likely to miss an issue?—A. Arthur Smith, 5204 Montclair Avenue, Montreal 29, Canada. *Serials being popular, I am naturally on the lookout for good ones. But good ones aren't easy to find; authors can make a good novelette from an idea. A good serial stems not so much from an idea as from a conviction. Those are harder to generate—so good serials can't be produced to order.*

Dear Mr. Campbell:

I take it that Mr. N. H. Boehmy speaks as one who believes that the physical scientist should refuse to work on any project which has destructive potentialities. In your answer to his letter, which appears in the August '52 issue of *Astounding*, you assume the position that the physical scientist need not concern himself with the applications to be made of his work. His job is simply to supply as much knowledge as possible from

his ivory laboratory to the populace at large.

It seems to me that the views of both you and Mr. Boehmy oversimplify greatly the problem at hand. In this world with its great demand for efficient use of power and of natural resources we cannot adopt the attitude that "ignorance is bliss" and refuse to follow any avenue of investigation merely because its products may be abused. The products may also be extremely beneficial; witness the airplane, the automobile, the barbiturates. Neither, however, can we allow the divorce of the physical scientist from society in general. This would lead not only to abuse of the results of scientific investigation but also to a community of scientists apart from their fellow men who would have about as much humanity as E. C. Berkeley's Simon and Squee, mere computers, albeit complex but still machines. The engineering schools, inclining to this view, have carried us quite a distance along this path already with their overspecialization.

The scientist, as any intellectual in this day, has a two-fold job. He must perform his professional work and he must also take a very active part in the life of the community around him. He must see to it that the general public has an appreciation and at least a superficial knowledge of his

work and he must take whatever opportunities offer themselves to insure use and prevent abuse of his discoveries by the general public. He must be broad rather than narrow in his interests, and he must be an active rather than a passive citizen.—James H. Ray, 412 No. 34th Street, Philadelphia 4, Pennsylvania.

If you are denied the right to express your opinions, you cannot be held responsible for decisions made. The physical scientist today is not allowed to express his opinion on political, sociological or psychological matters; he—witness Einstein's reception—is told that he is an untutored babe whose opinions are of no value save in his own field, and that he must keep his nose out of those fields wherein he is not an expert.

Now, my friend, which way do you want it?

Is the physicist socially responsible or not? If you consider that the word "responsible" up there has two meanings, you'll recognize that the two meanings must be accepted or rejected together. If he is fit to be held responsible—his opinions are fit to listen to.

The fact is, our Society wants to punish him, but will not allow that his advice must be accepted before he can be accused of being wrong.

Continued from page 10

seven basic postulates would, for that mind, be equivalent to giving the full message of all of Euclid's geometry, plus a lot of further propositions. Euclid never got around to working out.

The most satisfying art, whether painting or writing, music or what have you, seems to depend largely on this second type of low-redundance communication.

The Victorian authors are not satisfying today; they did not use the low-redundance communication system, and their readers had not been trained in its reception. The modern author must use the technique; he must present certain critical data, and allow the reader to develop the overall picture from that. The most effective painting will be that which presents the same aspect.

Ideally, a story or a painting should have a time-span development; it presents a situation, with sufficient data to make it possible for the recipient to analyze backwards in time to how the situation came about, and to run it forward in time to what the outcome will be.

Welker's cover, "The First Martian" represents such a painting; certain visual data is presented clearly. The situation at the moment represented by the painting is clear; the data presented is adequate to recognize the event-sequence that led to the situation, and to develop that

situation forward to its inevitable conclusion. It is, in consequence, something that allows an immense amount of communication with an extreme simplicity of form. Alejandro's recent "The Greater Fire" represents another of that type.

Chesley Bonestell's remarkable paintings represent an entirely different class of communication; they are essential to the existence of stories and paintings of the low-redundance type. Data is essential for the coded-memory system of low-redundance communication. The existence of the memory-data is essential if the postulate-development system is to work. Welker's "First Martian" leads to an inevitable conclusion *because* we know Mars does not have an atmosphere the human being in the painting can live in. Without that data from memory, we would be unable to develop the conclusion.

The work Bonestell, Richardson, Willy Ley, and others have done with full-message communication represents direct-experience data, on which a human mind builds. Photographs and full-detail descriptions must come first. To understand "boy" we must have the direct experience memory to tie that symbol to.

Bonestell's work, in turn, represents the developed conclusions from exceedingly low-redundance communications astronomers have received. A few lines in a spectrograph plate; minute shifts of images on telescope

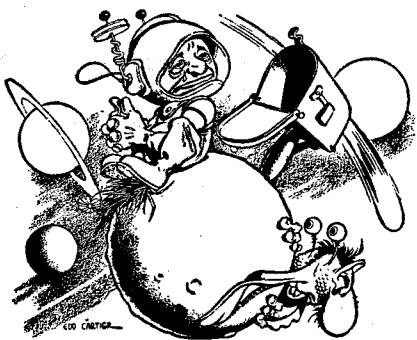
plates. This is the extremely low-redundance communication actually received. From this, using direct experience data on Earth, mathematics, logic, and integration of factors, the astronomer draws conclusions. Bonestell has translated those conclusions into visual images.

Essentially, the measure of the intelligence and competence of an entity, human or nonhuman, is *not* how much data he has—that's a measure of his past. The Library of Congress has more data than any human being who ever lived. That doesn't make it intelligent. It can't *handle*—i.e., interact, intercommunicate, analyze, synthesize, and recombine—that data. Intelligence is a function of the ability of the mind to communicate with exceedingly low redundancy. How little data do you have to be given before you can draw the correct conclusion? How much of the data necessary to thinking can you derive yourself from the data you have by analysis and resynthesis? How competent are you at throwing in a pure hypothesis that will yield the right answers?

Given the full data, an absolutely unintelligent machine, a magnetic tape recorder, can repeat it back. But how good is this Entity at deriving new information that was *not* supplied?

The highest mind is that which operates at the lowest levels of redundancy.

THE EDITOR.



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BY P. SCHUYLER MILLER

PEOPLE AND POLLS

One of the most interesting features of "The Reference Library's" recent poll was the fact that most of the fifty-odd voters accompanied their ballots with letters which cried for personal replies and, due in part to my move to a new job and a new state on very short notice, didn't get them. Some of their comments I want to pass on to you this month.

To me, as an erratic collector, perhaps the most interesting of the lot came from F. Bordes, geologist, of 76, Quai Marechal Joffre, Courbevoie, Seine, France. Although M. Bordes

shows a thorough knowledge of the best in English and American science fiction, he contributes some information on an almost completely neglected area, the "romans d'hypothèse" which have appeared in France since Jules Verne. I am taking the liberty of quoting much of his letter intact, for the benefit of readers who will want to follow up his leads.

"Our best SF writer," M. Bordes reports, "is J. H. Rosny aîné (1856-1940). He was not only a SF writer, and his huge work ranges from social novels — '*Nell Horn*' (1886); '*La Vague Rouge*' (1909) — to 'prehistoric' novels — '*La Guerre du Feu*'

(1911); '*Le Félin Géant*' (1920)—and to true SF. '*La Guerre du Feu*' is, I think, the best novel ever written on the prehistoric times of mankind." (In this I can agree heartily, though I know the book only from its English translation. It depicts the late Paleolithic as no other book has.)

Rosny, from what M. Bordes writes, was a pioneer in themes which did not become commonplace in science fiction until a generation or more later, and which were not dreamed of by Verne or even by his contemporary, Wells.

"'*Les Xipéhuz*' (1888) is a story of an alien form of life spreading on Earth in protohistoric times, and

washed out only by the sacrifice of thousands of men's lives. '*La Mort de la Terre*' (1908) deals with the last days of Mankind on a dried up Earth, in opposition to the 'ferromagnétaux,' an electromagnetic life. '*La Force Mystérieuse*' (1914): half-world's end, by the crossing of our Universe by another universe, with an alien matter. (Was this a forerunner of seetee? — PSM) '*Les Navigateurs del' Infini*' (ca. 1926): an exploration of Mars, and so on.

"A friend of the two great French scientists Jean Perrin and Emile Borel, he had, said J. Perrin, all that was necessary to make a first-class scientist. He was also — it is not al-

"Mr. Wolfe's projection of the present into the future is on the whole more satisfying than Orwell's 1984 or Mr. Huxley's Brave New World."—SATURDAY REVIEW

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ways the case with SF writers! — a very fine stylist. And I think he is the first (1888) to have imagined very alien forms of life, i.e. non-protoplasmic life.

"Today three at least of Rosny's SF are among the best ever written: '*Les Xipéhuz*,' '*La Force Mystérieuse*,' and '*La Mort de la Terre*.' They must be in any international reference library of SF."

Insular as we are in our Anglicization and Americanization of science fiction, we can hope that some publisher, with the help of a translator who knows science fiction — how about Anthony Boucher? — will bring us these French classics.

Science fiction did not end in France with Rosny aîné any more than it began with Jules Verne, Mr. Bordes points out. "I can quote, among the best works, '*Les Hommes Frénétiques*,' by Ernest Pérochon (1925), the only SF by this writer, a very good description of a hell-war of the future, with A-bombs (1925!) and utilization of other terrific weapons, based on the 'feeric systems,' which do not obey the principle of degradation of energy, but, on the contrary, aggragate energy.

"I can also quote '*Le Peuple du Pole*,' by Charles Derennes (1907): alas, it is now very easy to go to the North Pole, and it is a pity for this was very good SF. In '*L'Éclipse*,' by H. Regis (1939) all Mankind is blinded for two generations by a mutant of a

virus. '*La Belle Valence*,' by Théo Varlet and André Blandin (1923) is a time-travel novel in which a company of French soldiers of World War I, who have found in a house the Time Machine of Wells' engineer, go back to medieval Spain: a masterpiece of humor and relishing anachronisms. '*La Grande Panne*,' by Théo Varlet: an invasion of Earth by alien life, brought back from interplanetary space by the first rocket trying to get to the Moon. '*La Mort du Fer*,' by S. S. Held: destruction of iron by a disease."

Held's "Death of Iron," alone out of this shelf of French science-fiction classics, has been translated into English. If not Boucher, how about August Derleth?

Now that the name of that versatile and indefatigable individual has been brought fairly gracefully into the discussion, there is no better time to call your attention to his article, "Contemporary Science Fiction," which appeared in the January 1952 issues of both *The English Journal* and *College English*. You should be able to find it, if not in your public library or Department of Education or high-school library, then in the nearest college library.

In this article the life-long practitioner and anthologist of fantasy, and more recently of science fiction, undertakes to explain to a bewildered lot of ivory-tower-bound instructors of English just what the stuff is. He concludes

with a list of "Representative Science Fiction Since 1940" which very closely parallels the results of our own poll — which, in turn, he had inspired by his own "Arkham Sampler" ballot three years before.

Derleth offers about as good a definition as anyone of the indefinable science fiction: "... All imaginative fiction which grows out of scientific concepts ... whether already demonstrated or whether projected out of the writer's imagination into future space and time."

The science fiction of the 1920s and 1930s was typically interplanetary adventure — "space opera" — and so television and the comics still see it. However, Derleth points out, "within the last decade the pattern has been irrevocably broken. ... Writers of science fiction have made a somewhat self-conscious effort to recapture the literary status which science fiction had under the aegis of H. G. Wells and which it lost for a time save for isolated stories by ... writers who ... were not primarily writers of science fiction. ... The vast majority of fiction in the genre has little stylistic quality and is concerned comparatively little with the development of character. Literary merit is but a recent goal of the science-fiction writer and editor."

The article cites Pierce's criticism in *Science*, which I discussed in the first "Library" over a year ago, and which

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found that science fiction no longer contains science or the scientific spirit. It credits Charles Fort with exerting the greatest influence on early writers and readers in the field — an evaluation which, perhaps, we can discuss thoroughly at some later time. It credits *Astounding Science Fiction* — and John W. Campbell, Jr. as “Don A. Stuart” — for pulling the field up by its bootstraps, points to the English pioneering, and comments on several leading writers — van Vogt — “possibly . . . today’s most popular writer of science fiction” — Leinster, Bradbury — “the most literate and original of writers in the genre” — Heinlein — “the most ambitious in scope” — and Clark Ashton Smith.

The study closes with this summation, which I quote for what it is worth and in the hope of stirring up discussion here or in “Brass Tacks”:

“ . . . Some contemporary science fiction is making a serious claim to consideration as literature on the same classification as the more meritorious stories of crime and general adventure. But this is as yet only a very small percentage of the science fiction written or being written; there is no good reason to suppose that that percentage will alter very much in the years to come. Seen as a whole, science fiction remains a timely and appropriate development of escape reading in this atomic age; but its claim to literary distinction must rest on a small minority of the books and stories in

the genre.”

Well, is that a fair judgment or is it not? Before you write a hot letter to August Derleth, go over it again. Is the writer saying anything about science fiction that hosts of critics aren’t saying day in and day out about fiction in general? There may even be more memorable science-fiction books and stories in proportion to the number published than there are memorable “general” novels among all the yards of fiction put between hard covers every year.

On the other hand, don’t be too quick to assume that August Derleth, who is a poet and historian among other things, is talking about some vastly elevated type of “literary” writing. He likes good writing with, I think, a leaning toward the romantic and the slightly florid exemplified in H. P. Lovecraft, Clark Ashton Smith, and William Hope Hodgson. But so do I: so do many of you.

Derleth’s article closes, as I have said, with a suggested reading list of forty-two science-fiction books published since 1940. It would be begging a point, I suppose, to point out that such books as Wright’s “World Below,” the Balmer-Wylie “Worlds Collide” books, and Hodgson’s “House on the Borderland” do not belong in this category, since they are new editions of books which were first published before — and in Hodgson’s case long before — 1940, and that some of

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the short-story collections — most of them, in fact — illustrate the period before 1940 though they happen to have been collected in book form recently. However, thirteen of August Derleth's selections appear in the top twenty-eight books in your own popularity poll — the "basic" library — and your list and his coincide in all but two of the top twelve titles. The two are the Wells "Seven Famous Novels" and the Healy-McComas "Adventures in Time and Space."

Only seven of Derleth's nominations — which I would have included in the poll if I'd looked up his article in time — did not appear at all among the two hundred seventy-five books you nominated. They are: Hinko Gottlieb's "Key to the Great Gate," H. F. Heard's "The Great Fog," Judith Merril's paper-back anthology "Shot in the Dark," Ward Moore's "Greener Than You Think," Clark Ashton

Smith's "Lost Worlds," A. E. van Vogt's "Away and Beyond" — only just published as I write, though it has been hanging fire for a year or two — and Donald Wandrei's "The Eye and the Finger." Smith and Wandrei, judging from your letters, most of you would consider fantasy; Gottlieb is a dark horse of whom few readers seem to have heard; "Shot in the Dark" was paper — though admittedly you voted for other paper-backed books — and "Away and Beyond" wasn't out.

This catholicity of taste in style and theme is something on which Melvin Korshak of Shasta Publishers commented when, as you recall, he complained that it would be easier to name five top-notch science fiction books — tops not only as science fiction but as books — or fifty, than to list twenty-five. Most of the books now coming off the general and spe-

cialized presses have also had to meet the formula of pulp magazines, he points out. They had to conform to standards which were not primarily literary, and still be remembered in spite of this handicap.

Another approach to the same question came from James B. Cullum, Jr. of Roslyn, New York. "It seems to me," Mr. Cullum wrote, "anybody's personal choices, in science fiction as in most other things, would be subject to continual variation over time. This would be true even if new books were not constantly being added to the field. Twenty years ago I found much more pleasure in the 'Skylark' epics — and, for that matter, in Burroughs' Martian stories and Wells' 'The World Set Free' — than I do now . . . You should have called for three lists from each contributor, illustrating not only personal preferences and the literate approach but also the — as it were — adolescent approach."

Such a list, Mr. Cullum points out, might help librarians and teachers more than the mixed ballot of all ages, all interests which we actually polled. It would represent the stepping stones through which young people — and their elders — may become acquainted with science fiction and mature in their knowledge of and taste for it.

Summing up, the poll bears out Melvin Korshak that there are only a handful of books which everyone accepts as classics — only six books were

on half of the "basic" ballots, you remember. It bears out Korshak and August Derleth that science fiction is no great shakes as literature — *but*, generally speaking, the books which Derleth felt were worth recommending to college and secondary school English teachers are the same books you selected as best. The coincidence was even closer if you rule out fantasy and pre-1940 books: in fact, it's no coincidence — these books are good.

That teen-agers would select a different list from oldsters is probably also true. I'd like to try such a poll, but it doesn't seem practical. What is evidence is the fact that canny publishers of juvenile books, who know what young people want, are giving us Heinlein, MacDonald, Norton, del Rey, Clarke, Jones, Anderson, Oliver, and other top-notch writers which also make pretty good to very good reading for anyone of any age.

Remember this, out of the fact that intelligence follows a normal probability curve arises the fact that there will be youngsters half our age who can assimilate, appreciate, and will like books far tougher and more demanding than the ones we can take. There will be those among us whose interests and tastes in reading lag well behind the average high-school class. Any form of writing tries to encompass the whole span, since we're presumably living in an era when anyone can read. And — though this is hardly a fair analogy — some of the same

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books — Rabelais, Boccaccio, Chaucer — which some people study as literature, others, with other tastes, sneak out from under a counter as filth.

Of course science fiction isn't all superlative writing and deathless, thought-provoking intellectual exercise. On the whole it may not stir the emotions as much as a soap opera, but by golly it stirs the imagination! And what more do you want from your "escape" reading?

PLAYER PIANO by Kurt Vonnegut, Jr.
Charles Scribners Sons, New York.
1952. 295 pp. \$3.00

At the time when Kurt Vonnegut, Jr. began to write science fiction — and introduced the "Barnhouse effect" — he was working for a certain large electrical industry whose home plant is located on the south side of the Mohawk River, in upstate New York. Annually its executives assem-

ble at Association Island, in the St. Lawrence River, for stimulating thought and conversation. Not long ago one of its officials pointed out that the day of the completely automatic factory is nearly here.

Dr. Paul Proteus is manager of the Ilium Works of the United States — only — and nationwide — electrical industry, founded in the same year that Edison brought the ancestor of General Electric to Schenectady. The Works is on the north side of the Iroquois River, in upstate New York, and each summer the company's executives meet at the Meadows, an island in the St. Lawrence River, for inspirational athletic competitions, policy discussions, indoctrination, and serious drinking. The Ilium Works is to all intents and purposes completely automatic, and has been since early in the Third World War, ten years before, when machinists were replaced by punched tapes which they had

themselves helped to code.

This not-too-gentle satire of the Second Industrial Revolution, controlled by the miracle brain of Epicac XIV, deep in the bowels of Carlsbad Cavern, is a lot closer to reality than was Orwell's "Nineteen Eighty-Four." It would not be very difficult to replace men with machines, set up a society in which the Reconstruction and Reclamation Corps — alias "Reeks and Wrecks" — or a twenty-five year stretch in the Army take the place of a paid job for all but a machine-sorted engineering and executive caste — and in which a reactionary Shah of Bratpuhr drifts in and out, obtusely insisting that what Americans call "citizens" his people would call *takaru* — slaves.

Paul Proteus is close to the top of his profession when the book opens. Any day now he may be sent to Pittsburgh, to manage the Plant of Plants. But there have been a few respects in which his reactions and his associations don't quite measure up to what the machine expects of its bright young men. The problem of the book is: which way will Proteus run? Will he let his old friend, Ed Finnerty, contaminate his thinking with anti-machine ideas — even into open revolt? Or will he take the safer path for which he was bred and trained?

Here is the spirit of the Machine Age — our age — satirized in the vein of Huxley and Orwell, not so savagely or expertly perhaps, but cuttngly and

well. To be present at the death of Checker Charley — to learn about the train which starves old ladies who have forgotten their exit tickets — to be greeted by Dr. Bud Calhoun's personality car — to meet that mechanized skunk, Dr. Lawson Shepherd, or the great joiner Luke Lubbock — read "Player Piano," and decide which side of the river you want for yourself and your children.

INVADERS OF EARTH, Edited by Groff Conklin. Vanguard Press, New York. 1952. 333 pp. \$2.95

Groff Conklin, thanks to some obscure form of jet propulsion, has lifted himself way above any of his friendly competitors in the realm of science-fiction anthologizing. His job is made a little easier by the fact that instead of skimming the cream off the past year's crop, like Bleiler and Dikty, he can forage through the whole pasture of published fiction. It is hampered not a little by the way in which other browsers — not least himself — have fed there long before.

Conklin's collections are almost bound to be good and though it may not contain any of the great masterpieces, "Invaders of Earth" is one of his best, judged for its ability to provide a generally high level of entertainment. It is, as the name implies, a theme anthology — different writers' ideas of how the Earth will be invaded — or has been invaded — and by whom — or what.

There are three of the twenty-one stories in the book which will be new to fans who may have — and have read — every copy of every science-fiction magazine ever published in this country. Willy Ley has discovered and translated a pioneering German tale from before 1905 — Karl Grunert's "Enemies in Space." Anthony Boucher has written for the book a parable from the far future, "The Greatest Tertian," in which a posthuman race explores human literature. And for the first time since the Princeton University study in 1940 — and a subsequent pocket-book edition — here is the script of the Mercury Players' panic-producing broadcast of H. G. Wells "War of the Worlds," transplanted to New Jersey.

It's hard to choose a favorite from the book. In my case, it is probably Theodore Sturgeon's "Tiny and the Monster," a prime example of warm human characterization. Edgar Pangborn's "Angel's Egg" is up there near the top, too. And Fredric Brown's "The Waveries," Donald Wollheim's unusual "Storm Warning," Allan Lang's "An Eel By the Tail," David Grinnell's "Top Secret" — but why try to catalogue a uniformly good, if not exceptional, collection? Unless I miscount, eleven magazines are represented. As for authors, we have Murray Leinster, Robert Moore Williams, Eric Frank Russell, William F. Temple, Margaret St. Clair, Mack Reynolds, Milton Lesser, A. E. van Vogt,

Mildred Clingerman, Edward Grendon, William Tenn, Henry Norton, and Katherine MacLean, in addition to those previously mentioned.

SPECIAL REVIEW

DESIGN FOR A BRAIN, by W. Ross Ashby. John Wiley & Sons, New York. 260 pp. \$6.00

This is one of the most fascinating attacks on the problem of thinking in animal brains that I have encountered; unlike most such efforts, it



starts with a painstaking and exact definition of terms. Dr. Ashby is the Director of Research at the psychiatric hospital, "Barnwood House," and the fact that his attack on the problem here is expressed in the precision and crispness of statement that delights the physical scientist is a pleasure.

Many psychologists make the mistake of identifying numerical methods with science — perhaps because modern physical science is quite largely concerned with numerical values. Numerology, astrology, horsebetting, "systems" for winning at roulette and the like are also concerned with numerical values. This does not indicate they are sciences.

Physical science began with the non-numerical, but sharply defined, crisply expressed thinking of geometry and basic logic. Archimedes worked out the laws of flotation entirely by geometrical methods; his techniques were completely general, and completely non-numerical. (Incidentally, the old boy was sharp; his demonstrations all involved *spherical* water surfaces. They would not have been complete proofs for the Terrestrial environment if he had considered planar water surfaces!)

Dr. Ashby's approach to the problem is equally based on sharply defined, clearly thought through statements. Some of the points he makes are exceedingly valuable, and brilliantly stated because of their simplicity. My own favorite is the discus-

sion of the limits of an organism — i.e., where does the organism end, and the environment begin? He considers them an interacting whole, without valid distinction, and makes the point by considering a mechanic who has an artificial arm working on a stubborn engine. Is the artificial arm part of the organism that is struggling with the engine, or part of the environment the organism is struggling with? Since we normally think in terms of the nervous system, can the bones be considered part of the nervous system's environment? Where, then, can we properly draw a line of demarcation?

Also, in discussing the problem of thinking and learning, he sets up a type problem for consideration. Specifically, he does not use a problem of the experimental psychological laboratory, but a simple, common observation — because, as he states, "it is not likely to be called in question by the discovery of some small technical flaw." His type problem — to explain how a kitten, which on first encountering a fire in a fireplace, acts inappropriately, learns so that the adult cat adjusts its actions appropriately.

Eschewing numerical, technical approaches, the generalized problem can be analyzed with the most rigorous, clearly defined statements.

And, because Dr. Ashby's thinking and writing are both original and interesting, the book makes most interesting reading.

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